Józef Henryk Przytycki

Curriculum Vitae, February, 2024

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Personal Data:		Born: October 1953, Warsaw Poland, Married June 1984 to Teresa M. Szczepanek, 2 children: Tomasz born November, 1987 and Paweł born December, 1989.
Web page:		http://home.gwu.edu/p̃rzytyck/
Research interest:	primary :	Classical knot theory, topology and geometry of 3-manifolds, algebraic topology based on knots, skein modules and algebras, homology theories motivated by knot theory (subject class: 57).
	secondary:	Graph theory, hyperbolic geometry, 4-manifolds, statistical mechanics, representations of Lie algebras and Hopf algebras (quantum groups), Hecke algebras, character varieties, symplectic structures, Hochschild homology, cyclic homology, distributive homology, homology of Yang-Baxter operators, entropic magmas, and history of mathematics.
Education:	M.Sc.	Warsaw University, Department of Mathematics, Computer Science and Mechanics, 1977.
		thesis: *"Actions of Z_n-groups on 3-manifolds"*.
	Ph.D.	Columbia University, 1981,
		thesis: *"Incompressible surfaces in 3-manifolds"*
		thesis advisor: Professor Joan Birman
	Habilitation	Warsaw University, December 1994.
		Topic: *"Invariants of knots in 3-manifolds"*

Distinctions:

(18) 2022 OVPR Distinguished Researcher Award, George Washington University.

(17) GWU, CCAS Enhanced Travel award, July 1, 2019-June 30, 2020.

(16) Dean Research Chair (DRC) award (GWU, 2016-2019).

(15) International Conference "Knot Theory and Its Applications to Physics and Quantum Computing celebrating the 60th birthday of Prof. J.H.Przytycki was held at University of Texas at Dallas, January 5-9, 2015.

(14) Awarded the title of Professor of Mathematical Sciences by the President of Poland, Bronislaw Komorowski, at the Presidential Palace in Warsaw, January 23, 2013.

(13) Nominated for the Balzan Prize in Mathematics for 2010.

(12) Fellow of Washington Academy of Sciences (WAS); Elected 2005.

(11) The Oscar and Shoshana Trachtenberg Prize for Research Scholarship for 2005.

(10) Columbian research fellow (GWU), 2003-2004,

(9) GWU award for the Exemplary Paper in the Natural, Mathematical, and Biological sciences, for 1996-1997,

(8) The first Pulikowski's Lecture, Poznań, March 1994.

(7) Member of the **Institute for Advanced Study** (Spring semester of 1990).

(6) Lecture notes (*"Topology of 3-dimensional manifolds"*) won the prize of the President of the Warsaw University, 1989;

(5) Winner of **Kuratowski Prize** for young mathematicians (1982)

(4) Master thesis (later published, see [1]) won the first prize for student paper in the Polish Mathematical Society Competition (Marcinkiewicz's prize), 1977;

(3) The third prize for student paper in the Polish Mathematical Society Competition (Marcinkiewicz's prize), 1976;

(2) Rector's Prize for top students, Warsaw University, (several times, 1972-1977).

(1) Three times prize winner (top eight) in Polish Math. Olympiad (1970, 1971, 1972). Once in the third prize group (bronze medal) in International Mathematical Olympiad (1971); In 1972, prize winner of Polish Physics Olympiad.

Who'sWho

I.Marquis Who'sWho (several times) e.g.:
(1) Who'sWho in the World the 25th Silver edition, 2008,
(2) Who'sWho in America, 2009 (110th Anniversary Edition),
(3) Who's Who in Science and Engineering, 10th Anniversary Edition, 2008-2009,
(4) Who's Who in American Education, 8th Edition, 2007-2008,

II. Entry in 2000 outstanding intellectuals of the 21st Century,
First edition, 2002; International Biographical Centre, Cambridge CB2 3QP England Ed. Ross Hilton, pp.404-405.

Membership in Professional Organizations:

1. American Mathematical Society (AMS),

2. The Mathematical Association of America (MAA),

3. American Association for the Advancement of Science (AAAS),

4. New York Academy of Sciences (NYAS),

5. Washington Academy of Sciences (WAS) (Fellow)

6. The Polish Institute of Arts & Sciences of America (PIASA)

7. The Pilsudski Institute of America (PIA)

8. Polish Mathematical Society (PTM).

9. Association for Mathematical Research (Founding Member) (November 2021)

Employment:

1977-1982 Warsaw University (Poland), Assistant;

1982-1988 **Permanent position:**

Warsaw University (Poland), Adjunkt (Assistant Professor);

  (i) University of British Columbia, Visiting Assistant Professor, 1986-1987,
  (ii) Toronto University, Postdoctoral Fellow, 1987-1988.

1988-1989 University of British Columbia, Visiting Associate Professor,

1989   Michigan State University, Visiting Scholar, Fall semester of 1989.

1990   Institute for Advanced Study (Princeton), Member, Spring semester of 1990.

1990-1992 University of California at Riverside, Associate visiting professor/visiting scholar,

      (i) University of Tennessee, Knoxville TN, October-November 1991.

1992-1994 Odense University (Denmark), Lecturer (Associate professor)/visiting scholar).

    (i) Warsaw University (Poland), Fall semester of 1993.
    (ii) Göttingen (Germany), February 1994.
    (iii) Luis Pasteur University, Strasbourg, France, April-May 1994.

1994-1995 University of California at Berkeley, Visiting Associate Research Mathematician.

Permanent position:

(i) 1995- 1997
George Washington University, Assistant Professor.

(ii) 1997- 1999
George Washington University, Associate Professor.

(iii) 1999 - present
George Washington University, Professor.

Sabbatical 1999-2000
University of Maryland, College Park, and:

1. Japan (TWCU) June - August 1999.

2. England (Warwick University), November 1999.

3. Poland (Warsaw University), February - May 2000.

Columbian Research Fellowship, 2003-2004

Sabbatical 2006-2007
University of Maryland, College Park, and:

1. Poland (Warsaw and Gdansk Universities), November-December, 2006;

2. Poland (Warsaw and Gdansk Universities), February-March, 2007;

3. Banff, Canada, April, 2007;

4. Trieste, Italy, May, 2007;

5. Tokyo and Nagoya, Japan, June, 2007;

Sabbatical 2013-2014
University of Maryland, College Park, and:

1. Poland (Gdansk,Warsaw, Rzeszow, Slubice), May-September 2013;

2. Luminy, France, July 2013;

3. Mohali, India, December 2013;

Sabbatical 2020-2021
My sabbatical, academic year 2020-2021, was deformed by Covid pandemia (neither in person conferences nor international trips (and I planned several) were possible). Thus I was glad to have a permition to attend a 3-month long program at ICERM, Brown University, Providence R.I. "Braids" program. February-May, 2022. It was great experience and, in particular, I advanced a major paper (with Marithania Silvero) on time complexity of Khovanov homology. However I also spent a few weeks isolated with covid.

Editing

Editor of three research journals:

    (i) Editor of *Involve* (from 2007);
       http://pjm.math.berkeley.edu/inv/about/cover/cover.html

   (ii) Editor (member of the Editorial Board) of the journal *Fundamenta Mathematicae*,
       (from February 2004); http://journals.impan.gov.pl/fm/

  (iii) An Associate Editor of *the Journal of the Knot Theory and its Ramifications*
       (from November 1995); http://www.worldscinet.com/jktr/jktr.shtml
       Managing Editor (from 2017)

Editor of special volumes (31 published, and 1 in preparation):

(31) J.H. Przytycki - Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume IV(c), Journal of Knot Theory and its Ramifications; Volume 30, Issue 14 (December 2021)

(30) J.H. Przytycki - Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume IV(b), *Journal of Knot Theory and its Ramifications*; Volume 30, Issue 13 (November 2021).

(29) J.H. Przytycki - Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume IV(a), Journal of Knot Theory and its Ramifications; Volume 30, Issue 12 (October 2021).

(28) Co-editor (with Adams, C.C., Gordon, C.M., Jones, V., Kauffman, L.H., Lambropoulou, S., Millett, K.C., Ricca, R.L., Sazdanovic, R.), Proceedings of KNOTS16: Knots, Low-Dimensional Topology and Applications, Volume 3. *Journal of Knot Theory and its Ramifications*, Volume 28, Issue 13 (November 2019).

(27) Co-editor (with Adams, C.C., Gordon, C.M., Jones, V., Kauffman, L.H., Lambropoulou, S., Millett, K.C., Ricca, R.L., Sazdanovic, R.), Proceedings of KNOTS16: Knots, Low-Dimensional Topology and Applications, Volume 2. *Journal of Knot Theory and its Ramifications*, Volume 28, Issue 11 (October 2019).

(26) Co-editor (with Adams, C.C., Gordon, C.M., Jones, V., Kauffman, L.H., Lambropoulou, S., Millett, K.C., Ricca, R.L., Sazdanovic, R.), Springer, the series Proceedings in Mathematics & Statistics (PROMS); August, 2019, Proceedings of KNOTS16: Knots, Low-Dimensional Topology and Applications.

(25) Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume III, *Journal of Knot Theory and its Ramifications*; Vol. 27, No. 3, March 2018; 230 pages.

(24) Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume II, *Journal of Knot Theory and its Ramifications*; Vol. 26, No. 3, March 2017, about 240 pages.

(23) Co-editor (with V.Chmutov, L.H.Kauffman, and M.Karev) of the special issue of JKTR, "Proceedings of Knots in Washington XL; in memory of Sergei Duzhin (1956 - 2015)", March 9-11, 2015, George Washington University and Georgetown University Washington DC, USA"; *Journal of Knot Theory and its Ramifications*, Vol. 25, No. 12, October 2016; about 280 pages.

(22) Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman, R.Sazdanovic, and A.Sikora), Proceedings of Knots in Dallas II, 2015, Volume I, *Journal of Knot Theory and its Ramifications*; Vol. 25, No. 3, March 2016, about 260 pages.

(21) Co-editor (with Pawel Traczyk), *Banach Center Publications* 103, Proceedings of Knots in Poland III, Volume III, 103, December 2014, 387 pages.

(20) Co-editor (with Pawel Traczyk), *Fundamenta Mathematicae*, 225 (Proceedings of Knots in Poland III, Volume II), May, 2014, 364 pages; http://journals.impan.gov.pl/fm/

(19) Co-editor (with Pawel Traczyk), *Banach Center Publications*, Volume 100 (Proceedings of Knots in Poland III, Volume I), March, 2014, 271 pages: http://journals.impan.gov.pl/bc/ http://journals.impan.gov.pl/bc/Cont/bc100-0.html

(18) Co-editor (with S.Jablan, L.H.Kauffman and S.S.Lambropoulou) **Introductory Lectures on Knot Theory** (selected Lectures Presented at the Advanced School and Conference on Knot Theory and its Applications to Physics and Biology; Series on Knots and Everything – Vol 46, World Scientific, 2011/2012, 640 pages.

(17) Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman and V. Ramakrishna) Proceedings of Workshop on Knots and quantum computing, University of Texas at Dallas, Volume 2, *Jour. Knot Theory Ram.*, 20(1), January 2011, 229 + vi pages.

(16) Co-editor (with M.Dabkowski, V.Harizanov, L.Kauffman and V. Ramakrishna) Proceedings of Workshop on Knots and quantum computing, University of Texas at Dallas, Volume 1, *Jour. Knot Theory Ram.*, 19(6), June 2010, 121 + vi pages.

(15) Co-editor (with S.King, L.Kauffman, V.Manturov) Proceedings of International Workshop on "Invariants in Low Dimensional Topology" in Oberwolfach, Germany, Volume 3, *Jour. Knot Theory Ram.*, 19(2), February 2010, 189 + ix pages.

(14) Co-editor (with S.King, L.Kauffman, V.Manturov) Proceedings of International Workshop on "Invariants in Low Dimensional Topology" in Oberwolfach, Germany, Volume 2, *Jour. Knot Theory Ram.*, 18(10) October 2009, 141 + ix pages.

(13) Co-editor (with S.King, L.Kauffman, V.Manturov) Proceedings of International Workshop on "Invariants in Low Dimensional Topology" in Oberwolfach, Germany, Volume 1, *Jour. Knot Theory Ram.*, June 2009, 160+ ix pages.

(12) Co-editor (with Sofia Lambropoulou), Proceedings of International Conference Knots in Washington XX; 60th birthday of Louis H. Kauffman; Volume 5, *Jour. Knot Theory Ram.*, 16(10), December 2007, 211 + xi pages

(11) Co-editor (with Sofia Lambropoulou), Proceedings of International Conference Knots in Washington XX; 60th birthday of Louis H. Kauffman; Volume 4. *Jour. Knot Theory Ram.*, 16(7), September 2007, 159 + xii pages.

(10) Co-editor (with Sofia Lambropoulou), Proceedings of International Conference Knots in Washington XX; 60th birthday of Louis H. Kauffman; Volume 3. *Jour. Knot Theory Ram.*, 16(3), March 2007, 135 + viii pages.

(9) Co-editor (with Sofia Lambropoulou), Proceedings of International Conference Knots in Washington XX; 60th birthday of Louis H. Kauffman; Volume 2. *Jour. Knot Theory Ram.*, 15(8), October 2006, 158 + v pages.

(8) Co-editor (with Sofia Lambropoulou), Proceedings of International Conference Knots in Washington XX; 60th birthday of Louis H. Kauffman; Volume 1. In *Jour. Knot Theory Ram.*, 15(6), August 2006, 151 + xii pages.

(7) Co-editor (with V.F.R.Jones, V. Turaev, B.Wajnryb), Proceedings of International Conference "Knots in Poland 2003", Volume 3, *Fundamenta Mathematicae*, 190, June 2006, 297 pages.

(6) Co-editor (with V.F.R.Jones, V. Turaev, B.Wajnryb), Proceedings of International Conference "Knots in Poland 2003", Volume 2, *Fundamenta Mathematicae*, 188, December 2005, 340 pages.

(5) Co-editor (with V.F.R.Jones, V. Turaev, B.Wajnryb), Proceedings of International Conference "Knots in Poland 2003", Volume 1, *Fundamenta Mathematicae*, 184, December 2004, 353 pages.

(4) Co-editor (with V.F.R.Jones, C.Gordon, L.Kauffman and S.Lambropoulou), Proceedings of International Conference "Knots in Hellas 98", Volume 3, In: JKTR 10(5), August 2001, 170 pages.

(3) Co-editor (with V.F.R.Jones, C.Gordon, L.Kauffman and S.Lambropoulou), Proceedings of International Conference "Knots in Hellas 98", Volume 2. In: JKTR 10(2), March 2001, 175 pages.

(2) Co-editor (with V.F.R.Jones, C.Gordon, L.Kauffman and S.Lambropoulou), Proceedings of International Conference "Knots in Hellas 98", Volume 1. In the Series on Knots and Everything, Vol. 24 , 2000, 600 pp.

(1) Co-editor (with V.F.R.Jones, J.Kania-Bartoszyńska, V.Tuarev and P.Traczyk), Banach Center Publications, Vol. 42, "Knot Theory", 1998, 463 pages.

Editor of special volumes in preparation

(i) Co-editor (with Lou Kauffman), Papers in History of Quandles, in World Scientific Series on Knots and Everything, Vol. (not decided yet), to appear 2025 (in preparation).

Reviewing and refereeing

Reviewer of Mathematical Reviews of AMS and of Zentralblatt für Mathematik - Mathematics Abstracts.

Referee of papers submitted to various journals including:
Inventiones Mat., Topology, Topology and its Applications, Trans. Amer. Math. Soc., Pacific J.Math., Proc. Amer. Math. Soc., Notices Amer. Math. Soc., Math. Proc. Cambridge Philosophical Society, Canadian Math. Journal, Fundamenta Math., Journal of the Lond. Math. Soc., Bulletin of the London Mathematical Society, Journal of Knot Theory and its Ramifications, Annales Scientifiques de L'Éncole Normale Supérieure, Mathematics of Computations, Kobe Journal of Math., Asian Journal of Mathematics, Communications in Analysis and Geometry, Geometriae Dedicata, Revista Matematica, Quantum Information Processing, The International Journal of Sciences, Journal of Algebraic and Geometric Topology, l'Enseignement Mathematique, GT (Geometry and Topology; Warwick UK), AGT (Algebraic and Geometric Topology; Warwick UK), Bull. LMS, Advances in Mathematics.

Organizing Conferences

1. JMM Co-organizer (with Rhea Palak Bakshi and Sujoy Mukherjee) of the special session of AMS "Knots, Skein Modules, and Categorification" at the JMM meeting January 2024.

2. Co-organizer (with Sam Nelson (former studend of Litherland and my students Ali Guo, Anthony Christiana, Ben Mac Vikar and Ben Clingenpeel) Knots in Washington 49.96875 Dedicated to the memory of Rick Litherland, December 8-10, 2023.

3. Co-organizer (with my students Ali Guo and Anthony Christiana) of Knots in Washington 49.9375 conference, April 28-30, 2023. The conference was held in person with he exception of a plenary talk by Louis H. Kauffman which was given online.

4. Co-organizer (with Rhea Palak Bakshi, Radmila Sazdanovic, Marithania Silvero) of the special session of AMS,
Knots, Skein Modules and Categorification at the AMS Spring Southeastern Sectional Meeting, March 18-19, 2023 (Saturday - Sunday) Georgia Institute of Technology, Atlanta, GA; Meeting # 1184, Abstract Issue: 44/2. In Progress.

5. Co-organizer (with my students Ali Guo and Anthony Christiana) Knots in Washington 49.875 conference, December 9-11, 2022. The conference was held in person with he exception of a plenary talk by Louis H. Kauffman which was given online.

6. Co-organizer (with my students Dionne Ibarra, Gabriel Montoya-Vega, and Ali Guo) Knots in Washington 49.75 conference (it was a mixture of in person and online talks); April 2022.

7. Co-organizer (with Dionne Ibarra, Gabriel Montoya-Vega, and Ali Guo) Knots in Washington 49.5 conference, December 3-5, 2021. The conference was held in hybrid form. We had over 50 participants (including 20 in person) and 30 presentations.

8. Co-organizer (with Trang Le, S.Mukherjee) of the special session of AMS "on algebraic structures related to knot theory" at the Joint Mathematics Meetings (JMM), January 6-9, 2021 (online)

9. Co-organizer (with V.Harizanov, R.Sazdanovic and A.Shumakovitch) of Knots in Washington XLIX; February 7–9, 2020, George Washington University, Washington, DC, USA.

10. Co-organizer (with Stefan Jackowski and Henryk Torunczyk) of the special session "Borsuk and Eilenberg" devoted to topology, geometry, and homological algebra, at the Jubilee Congress of Polish Mathematicians in the centenary of PTM,
Kraków, September 3-7, 2019.

11. Co-organizer (with Witold Rosicki, Grzegorz Gromadzki, Michał Jabłonowski, Maciej Mroczkowski, Maciej Niebrzydowski)
Knots in Gdansk III; Gdansk, Poland, June 17-19, 2018.

12. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic and A.Shumakovitch) of Knots in Washington XLVIII; May 8-10, 2019, George Washington University, Washington, DC, USA.

13. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic and A.Shumakovitch) of Knots in Washington XLVII; January 20-21, 2019, George Washington University, Washington, DC, USA; (starting from KiW XVIII, partially supported by NSF).

14. Co-organizer (with M.Khovanov and A.Shumakovitch),
the special session of AMS: "Algebraic structures motivated by Knot Theory" at the Joint Mathematics Meetings in Baltimore, MD, January 16-19, 2019.

15. Co-organizer (with Michael K. Kinyon, Petr Vojtechovsky, Seung Yeop Yang), the special session of AMS:
"Non-associative algebraic structures and their (co)homology theories" at the AMS Sectional Meeting at the University of Arkansas, Fayetteville, AR, November 3-4, 2018 (Saturday - Sunday) Meeting #1142.

16. Co-organizer (with Witold Rosicki, Grzegorz Gromadzki, Michał Jabłonowski, Maciej Mroczkowski, Maciej Niebrzydowski)
Knots in Gdansk II; The conference took place in Gdansk, June 14-15 2018.

17. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic and A.Shumakovitch) of Knots in Washington XLVI; 70th Birthday of Oleg Viro; May 4-6, 2018 George Washington University, Washington, DC, USA.

18. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XLV; December 8-10, 2017; George Washington University, Washington, DC, USA.

19. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XLIV; April 28-30, 2017; George Washington University Washington, DC, USA.

20. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XLIII; 60th birthday of J. Scott Carter, December 9-11, 2016; George Washington University Washington, DC, USA.

21. Co-organizer (with Radmila Sazdanovic) of the special session on Algebraic Structures Motivated by and Applied to Knot Theory at the AMS meeting at North Carolina State University at Raleigh, Raleigh, NC, 12-13 November, 2016.

22. Co-organizer (with Colin Adams (Williams College, USA), Cameron Gordon (U. Texas at Austin, USA), Vaughan Jones (Vanderbilt U., USA), Louis H. Kauffman (U. Illinois at Chicago, USA), Sofia Lambropoulou (National Technical U. Athens, Greece), Kenneth Millett (U. California, Santa Barbara, USA), Renzo Ricca (U. Milano-Bicocca, Italy), Radmila Sazdanovic (North Carolina State University, USA)); Knots in Hellas 2016 International Conference on Knots, Low-Dimensional Topology and Applications July 17-23, 2016, International Olympic Academy Ancient Olympia, Greece

23. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XLII – Knots in the Triangle (Knots kNot in Washington) April 29 - May 1, 2016 North Carolina State University Raleigh NC.

24. Co-organizing (with Allison Henrich, Sam Nelson, Jozef Przytycki, Radmila Sazdanovic) Special Session on Knots in Washington (State) at Joint Mathematics Meetings AMS; January 6-9, 2016 Seattle, WA,

25. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XLI, December 4-6, 2015 George Washington University.

26. Co-organizing (with A.Crans and R.Sazdanovic) Invited Session "Algebraic Structures Motivated by Knot Theory" at MAA MathFest, Washington, DC, August 5-8, 2015. http://www.maa.org/meetings/mathfest/program-details/2015/invited-sessions/algebraic-structures-motivated-by-knot-theory-abstracts

27. Co-organizing (with M.Borodzik, K.Pawalowski, P.Traczyk) a conference: Glances at Manifolds: Knots and Links, Manifolds and Orbifolds, Toric Topology and Group Actions, July 17-20, 2015, Kraków, Poland,

28. Co-organizer (with V.Harizanov, P.Kainen, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XL: in memory of Sergei Duzhin (1956 - 2015) , March 9-11, 2015.

29. Co-organizing (with Radmila Sazdanovic, Alexander Shumakovitch, and Hao Wu) the special session of AMS: "Algebraic Structures Motivated by and Applied to Knot Theory" at the Spring Eastern Sectional Meeting Georgetown University, Washington, DC March 7-8, 2015, Meeting #1107 .

30. Co-organizing (with Radmila Sazdanovic) the special session of AMS: Algebraic Structures Motivated by Knot Theory at the Fall Southeastern Sectional Meeting University of North Carolina at Greensboro, Greensboro, NC November 8-9, 2014 (Saturday - Sunday) Meeting #1105.

31. Co-organizing (with Oliver Dasbach, Uwe Kaiser, Krzysztof Pawalowski, and Pawel Traczyk) a special session "Knot Theory" at the DMV-PTM Mathematical Meeting in Poznan, Poland,

September 17-20, 2014. DMV-PTM Mathematical Meeting, is a joint initiative of the Polish Mathematical Society (Polskie Towarzystwo Matematyczne) and the German Mathematical Society (Deutsche Mathematiker-Vereinigung).

32. Member of the scientific committee (with Tom Mrowka, Andrzej Ranicki and Andrzej Szczepanski) of Andrzej Jankowski Memorial Lecture and Mini Conference (from September 2014)

33. Co-organizer (with M.Dabkowski, V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXVIII: 30 years of the Jones Polynomial, May 9-11, 2014.

34. Co-organizing (with Lou Kauffman and Sam Lomonaco) the special session of AMS: 'Knots and Applications" at the AMS meeting March 29-30, 2014 at University of Maryland, Baltimore County, Baltimore, MD.

35. Co-organizer (with M.Dabkowski, V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXVII, January 19-20. 2014.

36. Co-organizing (with M.Dabkowski, R.Sazdanovic, A.Shumakovitch, and H.Wu) the special session of AMS: Algebraic Structures Motivated by Knot Theory at Joint Mathematics Meetings, January 15 - 18, 2014, Baltimore Convention Center.

37. Co-organizing (with W.Rosicki), of the special sesion on Knot Theory at the conference: 5. Forum Matematykow Polskich, Rzeszow, Poland, 16-20 September, 2013.

38. Co-organizing (with K.Pawalowski), of the conference Knots, Manifolds and Group Actions, September 16-19, 2013, Slubice, Poland.

39. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXVI, May 3-5, 2013.

40. Co-organizer (with V.Harizanov, M.Dabkowski, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXV: Categorification of Knots, Quantum Invariants and Quantum Computing December 7-9, 2012.

41. Co-organizer (with P.Traczyk and B.Wajnryb) of a Mini-symposium and special session STS "Knot Theory and its ramifications" at The 6th European Congress of Mathematics Krakow, Poland, July 2-7, 2012.

42. Member of Scientific Committee of Alexandroff Readings International Topological Conference; Moscow (Russia), May 21-25, 2012; http://dubrovinlab.msu.ru/events/conference/alexandroff2012/ Co-organizing with Ivan Dynnikov the Knot Theory section of the conference.

43. Member of Scientific Committee of Polish Mathematical Society (PTM) hundred aniversary congress, Krakow, Poland, September 2019.

44. Co-organizer (with R.Sazdanovic, A.N.Shumakovitch, and H.Wu), the special session of AMS: "Homology theories motivated by Knot Theory" at 2012 Spring Eastern Sectional Meeting; March 17-18, 2012, George Washington University Washington, DC

45. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXIV: Categorification of Knots, Quantum Invariants and Quantum Computing March 14-16, 2012.

46. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXIII: Categorification of Knots, Algebras, and Quandles; Quantum Computing December 2-4 2011.

47. Swiss Knots 2011 the conference on Knot Theory and Algebra Lake Thun, Switzerland, May 22-27, 2011 (co–organizer with Anna Beliakova, Dror Bar-Natan, and Thang Le); (NSF supported);

48. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXII: Categorification of Knots, Algebras, and Quandles; Quantum Computing, April 29–May 1, 2011.

49. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXXI: Categorification, Quandles, Quantum knots and Quantum computing; December 3-5, 2010.

50. Co-organizer (with S.Jablan, L. Kauffman, and S.Lambropoulou), KNOTS IN CHICAGO, University of Illinois at Chicago, USA, September 10-12, 2010 (supported by NSF).

51. Co-organizer (with P.Traczyk), Knots in Poland III, Stefan Banach International Mathematical Center, Poland, July 19-25, Warsaw, and July 25- August 4, 2010, Bedlewo, Poland (NSF supported).

52. Co-organizer (with M.Khovanov and R.Sazdanovic), the special session of AMS: "Homology theories for knots and skein modules" at 2010 Spring Eastern Sectional Meeting May 22-23, 2010, New Jersey Institute of Technology, Newark.

53. Co-organizer (with V.Harizanov, Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXX, May 19-21, 2010.

54. Co-organizer (with Y.Rong, R.Sazdanovic, A.Shumakovitch, and H.Wu) of Knots in Washington XXIX, 30 years of Quandles, 10 years of Khovanov homology, December 4-6, 2009.

55. Co-organizer (with S.Jablan, L. Kauffman, and S.Lambropoulou) of the Advanced School and Conference on Knot Theory and its Applications to Physics and Biology at the International Centre for Theoretical Physics, Trieste, Italy, May 11-29, 2009; (http://cdsagenda5.ictp.trieste.it/full_display.php?smr=0&ida=a08157)

56. Co-organizer (with M.Dabkowski, V.Ramakrishna, Y.Rong, A.Shumakovitch, K.Taniyama, and H.Wu) of Knots in Washington XXVIII (follow up to Workshop on Knots and quantum computing), GWU, February 27 – March 1, 2009;

57. Co-organizer (with Oyama, Y.Rong, A.Shumakovitch, K.Taniyama, T.Tsukamoto, H.Wu, and A.Yasuhara) Knots in Washington XXVII, GWU, January 9-11, 2009.

58. Co-organizer (with V. Harizanov), the special session of AMS: Orderings in Logic and Topology, January 4-8, 2009, Washington, DC.

59. Co-organizer (with K.Pawalowski, W.Rosicki, A.Szczepanski) Conference on Algebraic and Geometric Topology June 09-13, 2008, Gdansk, Poland.

60. Co-organizer (with L.Kauffman, S.King, V.Manturov), International Workshop "Invariants in Low Dimensional Topology" in Oberwolfach, Germany, May 4-10, 2008.

61. Co-organizer (with Y.Rong, A.Shumakovitch, and H.Wu) Knots in Washington XXVI, GWU, April 18-20, 2008.

62. Co-organizer (with M.K.Dabkowski and V.Ramakrishna), Workshop on Knots and quantum computing, University of Texas at Dallas, December 16-22, 2007 (supported by an NSF grant).

63. Co-organizer (with Y.Rong, A.Shumakovitch, D.Silver, and H.Wu), conference Knots in Washington XXV, GWU, December 7-9, 2007.

64. Co-organizer (with M.K.Dąbkowski, A.S.Sikora and P.Traczyk), of the special session of AMS/PTM International Meetings: "Invariants of links and 3-manifolds" Warsaw, Poland, July 31 – August 3, 2007.

65. Co-organizer (with Y.Rong and A.Shumakovitch) Knots in Washington XXIV; Dedicated to the memory of Xiao-Song Lin April 13-15, 2007, GWU.

66. Co-organizer (with J.Kania-Bartoszynska and P.Traczyk), Workshop: Knots and Braids, Banach Center, Warsaw, Poland, Dec. 11-17, 2006;

67. Co-organizer (with Y.Rong and A.Shumakovitch); Knots in Washington XXIII; Quandles, their homology and ramifications, November 17-19, 2006.

68. Co-organizer (with Y.Rong and A.Shumakovitch) Knots in Washington XXII, GWU, May 5-7, 2006.

69. Co-organizer (with Y.Rong and A.Shumakovitch) Knots in Washington XXI: Skein modules, Khovanov homology and Hochschild homology, GWU, December 9-11, 2005.

70. Co-organizer (with Louis H. Kauffman and Fernando J. O. Souza) AMS-IMS-SIAM Joint Summer Research Conference; Quantum Topology–Contemporary Issues and Perspectives, Snowbird Resort, Snowbird, Utah, Sunday, June 5 – Thursday, June 9, 2005,

71. Co-organizer (with M.Dąbkowski and R.Gelca), the special session of AMS: "Invariants of links and 3-manifolds" at the AMS Meeting in Lubbock (Meeting #1006), April 8-10, 2005.

72. Co-organizer (with S.Lambropoulou, Y.Rong) Knots in Washington XX; 60th birthday of Louis H. Kauffman, GWU, February 11-13, 2005.

73. Co-organizer (with P.Kainen, Y.Rong) Knots in Washington XIX: Topology in Biology 2, Georgetown University and GWU, November 12-14, 2004.

74. Co-organizer (with Marta M.Asaeda and Adam S.Sikora) the special session of AMS: "Invariants of knots and 3-manifolds" at the AMS meeting in Pittsburgh (Meeting #1002), November 6-7, 2004.

75. Co-organizer (with Y.Rong) Knots in Washington XVIII: Khovanov homology, GWU, May 28-30, 2004.

76. Co-organizer (with M.M.Asaeda, M.K.Dąbkowski, Y.Rong) Knots in Washington XVII, December 19-21, 2003, GWU.

77. Co-organizer (with Joanna Kania-Bartoszyńska, Pawel Traczyk, Vladimir Turaev and Bronek Wajnryb) of the international conference/mini-semester: "Knots in Poland 2003", July 7-13, 2003 (Warsaw), July 14-27, 2003, Bedlewo.

78. Co-organizer (with M.Asaeda, W.Goldman and J.Millson) Knots in Washington XVI, May 5-7, 2003, UMD.

79. Co-organizing (with Mark Kidwell and Yongwu Rong) the special session of AMS: "Algebraic Topology Based on Knots" at the January 2003 AMS meeting in Baltimore, MD.

80. Co-organizer (with K.Kobayashi, Y.Rong, S.Suzuki, K.Taniyama, T.Tsukamoto and A.Yasuhara), Knots in Washington XV (Japan-USA Workshop on Knot Theory II); January 10-15, 2003, GWU and JHU.

81. Co-organizer (with Dubravko Ivansic and Yongwu Rong) Knots in Washington XIV, GWU, May 17, 2002

82. Co-organizer (with Dubravko Ivansic) of the conference Knots in Washington, XIII, December 16, 2001 (see: http://gwis2.circ.gwu.edu/ przytyck/knots/index.html)

83. Co-organizing (with L.Kauffman and F. Souza) the special session of AMS: "Quantum Topology". November 10-11, 2001 Irvine, CA (2001 Fall Western Section Meeting) Meeting # 972.

84. Co-organizer (with Dubravko Ivansic, Ilya Kofman, Yongwu Rong and Akira Yasuhara) of the conference Knots in Washington, XII, May 10-12, 2001 (see: http://home.gwu.edu/ przytyck/knots/index.html)

85. Co-organizer (with Dubravko Ivansic, Yongwu Rong, Dan Silver and Akira Yasuhara) of the conference Knots in Washington, XI, December, 2000.

86. Co-organizer (with Kazuaki Kobayashi, Yongwu Rong, Kouki Taniyama, Tatsuya Tsukamoto and Akira Yasuhara) of the conference Knots in Washington, X, Japan - USA ; workshop in Knot Theory, (GWU and UMCP) January 23-30, 2000

87. Co-organizer (with D.Ivansic, Y.Rong, and T.Stanford) of the special session of AMS: "Invariants of Knots and 3-manifolds" at the January 2000 AMS meeting in Washington, D.C.

88. Co-organizer (with Y.Rong) of Knots in Washington, IX, Conference on Knot Theory and its Ramifications, September 24-25 , 1999, at the George Washington University.

89. Co-organizer (with Y.Rong) of the conference on Knot Theory and its Ramifications: "Knots in Washington", VIII, GWU, April 30 – May 1, 1999.

90. Co-organizer (with S.Naik) of the special session of AMS: Symmetries of Knots and Three-manifolds; 1999 Spring Western Section Meeting Las Vegas, NV, April 10-11, 1999 Meeting #942

91. Co-organizing (with P.Kainen and Y.Rong) a conference on Knot Theory and its Ramifications: "Knots in Washington, VII (Topology in Biology), Georgetown University, October 23-24, 1998,

92. Co-organizing with C.Gordon, V.F.R.Jones, S.Lambropoulou,S.Negrepontis Knots in Hellas – International Conference on Knot Theory and its ramifications, Delphi (Greece) August 7-15, 1998;

93. Co-organizing a conference on Knot Theory and its Ramifications: Knots Theory days - Knots in Washington, VI; Feb.8-9, 1998, U.S. Naval Academy, Annapolis.

94. Co-organizing the special session of AMS: Knot Theory and Quantum Topology. (at American Mathematical Society Meeting in Baltimore), Jan. 9-10, 1998.

95. Co-organizing a conference on Knot Theory and its Ramifications: "Knots in Washington, V", University of Maryland (College Park), November 22, 1997.

96. Co-organizing the special session of AMS: Knot Theory and 3-Manifolds, University of Maryland, College Park, April 12-13, 1997.

97. Co-organizing a conference on Knot Theory and its Ramifications: "Knots in Washington IV" (it is one in the series of conferences devoted to knot theory and its ramifications), University of Virginia, April 5, 1997.

98. Co-organizing a conference on Knot Theory and its Ramifications: "Knots in Washington; III", GWU, October 18-20, 1996.

99. Co-organizing a mini-conference on Knot Theory and its Ramifications: "Knots in Washington; II", GWU, March 30, 1996.

100. Co-organizing a mini-conference on Knot Theory and its Ramifications: "Knots in Washington; I", GWU, October 28, 1995.

101. Co-organizing (with V.F.R. Jones, J. Kania-Bartoszyńska, P. Traczyk and V.G. Turaev) a mini-semester on Knot Theory at the Stefan Banach International Mathematical Center (Warsaw , Poland), July 17, 1995—August 18, 1995.

102. Directed the Spring Mathematical School on Differential Topology for talented undergraduate students, 1979.

103. Member of Scientific Committee of Low Dimensional Topology Conference organized in January 1998 at Universidade da Madeira (Portugal).

104. Member of the International Advisory Board of the First International Workshop on **Graphs − Operads − Logic**, Cuautitlán, México, March 12-16, 2001.

105. Member of the International Advisory Board of the Third International Workshop on **Graphs − Operads − Logic**, México, February 4-13, 2004.

National Science Foundation (NSF) and National Security Agency (NSA) support:

(1) NSF-DMS-9808955, July 15, 1999 – June 30, 2000.
Amount awarded: $ 34,000; (**Personal research grant**).

(2) NSF (AN: CCLS20221A) May 1, 2004 - April 30, 2005
Amount awarded: $10,000.
Project Title: Knots in Washington XVIII; Khovanov homology

(3) PI in the NSF proposal DMS-0555648, January 1, 2006 – December 31, 2006
Amount awarded: $20,000.
Project Title: Knots in Washington XXI: Skein modules, Khovanov homology and Hochschild homology,

(4) Co-PI in NSF grant (# 0745204) "Workshop on Knots and Quantum Computing" (M.Dabkowski from UT Dallas is the PI); Total Award Period Covered: September 1, 2007 - August 31, 2008; extended till August 2009;
Total Award Amount: $24,000; grant to organize interdisciplinary conference.
($5,000 transferred to GWU for a follow up Knots in Washington conference.)
Two Volumes of Proceedings were published in JKTR.

(5) PI in the National Security Agency (NSA) Project "Quandles, Burnside Groups, Skein Modules and Khovanov Homology: Investigating Algebraic Structures Motivated by Knot Theory",
Total Award Amount: $61,548.
Grant was awarded for the period March 21, 2008 - March 21, 2010.
Personal research grant.

(6) PI in NSF grant Proposal (DMS-#0817858) for "Knots in Washington; A Conference Series on Knot Theory and its Ramifications" , for 3-years starting March of 2008 (Y.Rong, A.Shumakovitch and H.Wu are co-PI).
Total Award Amount: $ 97,971.00; grant to organize Knots in Washington conferences.
Grant was awarded for the period May 15, 2008 - April 30, 2011.

(7) Co-PI in the NSF grant (DMS- 0925541) (PI. L.Kauffman).
$ 28,000 Total Award Period Covered: 03/01/09 - 02/28/10
ICTP Summer School and Conference on Knot Theory.
Recommended, April 9, 2009. Grant was extended till February 28, 2011 and was used to organize the follow up conference "Knots in Chicago" in September 2010.

(8) PI in the NSF Grant (proposal DMS 1034753):
"Knots in Poland III: conference on Knot Theory and its Ramifications" (To support USA based participants for 'Knots in Poland III conference)
Period Covered: 07/01/10 - 06/30/11;
Total Award Amount: $28,000

(9) PI in the National Security Agency, NSA-AMS 091111 project (**personal research grant**):
"Investigating Algebraic Structures Motivated by Knot Theory: homology of quandles, Burnside groups, skein modules and Khovanov homology."
Award Period : March 3, 2011 - March 2, 2013,
Total Award Amount: $67,928.00 (Awarded).
Extended till September, 2013.

(10) PI in NSF-DMS-1137422 award "Knots in Washington; A Conference Series on Knot Theory and its Ramifications" , for 3-years starting September 1, 2011 (V.Harizanov, A.Shumakovitch and H.Wu are co-PI).
Total Award Amount: $ 66,047.00; grant to organize about six Knots in Washington conferences.
Grant was awarded for the period: **September 1, 2011 – August 31, 2014**; (the first two conferences in this grant took part: December 2-4 2011 and March 14-16, 2012) (extended till August 31, 2015).

(11) Co-PI (PI, Thang Le) in NSF grant: Swiss Knots 2011: Knot Theory and Algebra, (To support USA based participants)
Period Covered: 04/01/11 - 03/31/12
Total Award Amount: $ 26,650.00.

(12) PI (with co-PI Professors Valentina Harizanov, Alexander Shumakovitch, Hao Wu and our Alumni (PhD 2010) Radmila Sazdanovic), NSF grant: "Knots in Washington: A Conference Series on Knot Theory and its Ramifications", September 1, 2015 – August 31, 2018. Award No. 1543617, **Total Award Amount: $ 83,998.00**. No cost extention till August 31, 2019

(13) co-PI NSF Knots in Hellas 2016 (with K. Millett PI, R.Sazdanovic co-PI); Title: USA Graduate Student/Recent PhD Travel Support for the conference Knots, Low-Dimensional Topology and Applications (Knots in Hellas 2016) Proposal: 1632551:
Total Award Amount: $ 34,000 **Period Covered: 02/02/16 - 02/01/17**

(14) (Pending) PI (with co-PI Valentina Harizanov (GWU), Mee Seong Im (United States Naval Academy) Mikhail Khovanov (Columbia University), Radmila Sazdanovic (North Carolina State University)) NSF grant: "Knots in Washington: Conferences on Knot Theory and its Ramifications". Period of Performance Start 2024-10-01; Period of Performance End 2027-09-30 **Total Award Amount: $ 96,729.00**

(15) **Simons grants** Simons personal grant: granted for 5 years, 2014-2019.
Proposal Number (pC ID): 316446; Simons Collaboration Grant for Mathematicians entitled "Algebraic structures motivated by and applied to Knot Theory" has been selected for funding:

Proposal Number (pC ID): 316446, Award Number: 316446. granted for 5 years, September 1,2014- August 31, 2019 **Total amount: $35,000.00**.

(16) **Simons grants** Simons personal grant: granted for 5 years, September 1, 2019- August 31, 2024.
Proposal Number (pC ID), Award Number: 637794: Award Number: ECNS21687N
Project Title: In search for connections between Khovanov and Yang Baxter homologies Grant Maker: Simons Foundation; announced in the e-mail: Apr 30, 2019 recommended,
Total amount: $42,000.00.

(17) Pending Proposal: Title: Skein modules of 3-manifolds: from linear and quadratic to cubic and higher **Simons Personal grant** Simons personal grant: for 5 years, September 1, 2024- August 31, 2029.
Grant (gift) maker: Simons Foundation
Total amount: $35,000.00 (5(6,000 + 1,000))
Application ID: MP-TSM-00007884

Other grants outside GWU

(17) Co-PI in the Polish Scientific Grant: Nr. N N201387034 (Algebraic Topology); Grant was awarded for the period April 29, 2008 – April 29, 2011.
(I am one of many participant - the only one from outside of Poland - the grant should allow us to invite Polish mathematicians to GWU or/and finance my trip to Poland to deliver series of lectures).

(18) Co-PI-director (with S.Jablan, L.Kauffman and S.Lambropoulou) of the grant to organize ICTP Summer School and Conference on Knot Theory, Trieste, Italy (11-29 May 2009). It is awarded by European Union grant agency via ICTP. Amount: 50,000 Euro (appr. $75,000) Grant was covering expenses of third world participants of the School and Conference at European Union grant via ICTP (International Centre for Theoretical Physics, Trieste, Italy), and to cover costs of publishing Proceedings of the School and Conference.

(19) Participant in the scientific basic research project No. 174012: "Geometry, Education, and Visualization with Applications'("Knot Theory, Algorithms, and its Applications"), of the Ministry of Science and Technological Development, Serbia, in the period 2011-14. The project leader of this project is Prof. Dr Zoran Rakic. **Project is approved April 4, 2011**.

(20) Participant in the scientific grant supported by Greek Government and European Union (PI Sofia Lambropoulou): "Algebraic modeling of topological and computational structures". Grant has been approved in April, 2012 and covers 2012-2015 period.
This research has been co-financed by the European Union (European Social Fund - ESF) and Greek national funds through the Operational Program "Education and Lifelong Learning" of the National Strategic Reference Framework (NSRF) - Research Funding Program: THALES: Reinforcement of the interdisciplinary and/or inter-institutional research and innovation.

Internal GWU grants:

(1) CCAS Dean's Research Chairs, September 1, 2016, August 31, 2019. $6,000 ($2,000 per year). Title: The case for modern Knot Theory: connecting Khovanov homology and distributive homology via homology of Yang-Baxter operators

(1') GWU, CCAS Enhanced Travel award, $2,500, July 1, 2019-June 30, 2020.

(2) GWU CIFF Fund: Center for Quantum Computing, Information, Logic & Topology (with V.Harizanov (PI), W.Parker and A. Eskandarian), $48,960; July 1, 2013 - June 30, 2015

(3) GWU travel grant $2,000 for DMV-PTM Mathematical Meeting in Poznan, Poland, September 17-20, 2014;

(4) GWU Research Enhancement Fund (REF) project: "Quantum Computation, Complexity and Information" (with V.Harizanovi (PI), W.Parker and A. Eskandarian), $88,228; August 2009 - August 2011

UFF/CCFF support:

(5) CCAS/UFF research grant (with V.Harizanov) Theory of Mathematical orders at the Frontier of Logic and Topology. 2008, amount: $14,079 July 1, 2008 - June 15, 2009.

(6) CCAS/UFF research grant proposal: *Homology of Quandles*;
Period Covered: July 1, 2010 – June 30, 2011;
Total Costs Requested: $15,330. Granted CCAS grant.

Teaching Experience:

1. Taught courses in topology of 3-manifolds, knot theory, linear and abstract algebra, analytical functions and differential geometry (at Warsaw University before 1995), Topologia niskowymiarowa i Teoria węzłów (Knot theory and low-dimensional topology) (Warsaw University, 2000). Taught also a graduate course in algebraic topology at UBC (1986-1987), a course in calculus at University of Toronto (1987-1988), a course in linear algebra (UBC Spring 1989), "Geometry of graphs and knots" (UBC summer 1989), a graduate course "Skein invariants of links in 3-manifolds, Yang-Baxter equation and statistical mechanics" (Michigan State Univ., Fall 1989), a course "An introduction to the theory of numbers" (UBC, Summer 1990), two courses in calculus (UC Riverside), and courses in Knot Theory, Convex Analysis, and Representations of Groups and Algebras (Odense University).

Teaching at GWU:

- Fall semester 2022:
Math 1009- Mathematical Ideas I, Topics in Topology (6890); 4 students (+ Keshav)

- Spring semester 2022;
Topics in Topology (6890) 6 students (+ Dionne Ibarra-Kunkel auditing).
Math. 295: Reading and Research for Ali Guo, Gabriel Montoya Vega, Dionne Ibarra-Kunkel

- Fall semester 2021:
  Math 1009-11:   Mathematical Ideas I, 6 students.
  Math 1009-12:   Mathematical Ideas I, 27 students.
  Mathathon 6.5; "Generalized Kauffman-Harary Conjecture on Fox colorings of alternating diagrams;
  Rhea Palak Bakshi, Dionne Ibarra-Kunkel, Gabriel Montoya Vega, Deborah Weeks; December 6-22, 2021.

- Spring semester 2021;
  Sabbatical;
  Math. 295: Reading and Research for Dionne Ibarra-Kunkel (3 credits), Gabriel Montoya-Vega: (6 credits) Deborah Weeks: (6 credits),

- Fall semester 2020:
  Sabbatical;
  Math. 295: Reading and Research for Dionne Ibarra-Kunkel (6 credits), Gabriel Montoya Vega: (6 credits) Deborah Weeks: (3 credits)

- Spring semester 2020; (partially online because of Covid)

- Fall semester 2019:

- Spring semester 2019;
  Topics in Topology (6890) 7 students (+ S.Mukherjee auditing).
  Math. 295: Reading and Research for Rhea Palak Bakshi.
  Math. 295: Reading and Research for Dionne Kunkel.

- Fall semester 2018:
  Math 1009-10:   Mathematical Ideas I, 69 students.
  Topics in Topology (6890-10) 8 students (+ S.Mukherjee auditing).
  Math. 295: Reading and Research for Rhea Palak Bakshi.
  Math. 295: Reading and Research for Dionne Kunkel.

- Spring semester 2018;
  Algebraic Topology (6820), 5 students + 2 auditing.
  Math. 6995 or Math. 295: Reading and Research:

  (1) Reading and Research for Rhea Palak Bakshi: Mathathon III: product to sum formulas in Kauffman bracket skein algebras.

  (2) Reading and Research for Dionne Kunkel: Abstract Algebra for Knot Theory.

- Fall semester 2017:
  Math 1009-10:   Mathematical Ideas I, 88 students.
  General and Geometric Topology (6910) 11 students (+ X.Xiao, S.Mukherjee).
  Math. 295: Reading and Research for Rhea Palak Bakshi.

Honors Undergraduate Research Assistantship with J. Przytycki (the University Honors Program): 2.00 credits (Fall 2017)
For Monica Kavathekar.

- Spring semester 2017:
Dean's Research Chair;
Math. 295: Reading and Research:
Reading and Research for Rhea Palak Bakshi and Sujoy Mukherjee

- Fall semester 2016:
Math 1009-10: Mathematical Ideas I, Math. 6101: Algebra I, Math. 295: Reading and Research for Rhea Palak Bakshi and Sujoy Mukherjee

- Spring semester 2016:
Math. 6860: Topics in Knot Theory Spring 2016
Math. 1010 Mathematical Ideas II, Spring 2016
Eliza Dilan Goren: Honors Undergraduate Research Assistantship with J. Przytycki: 4.00 credits (Spring 2016)
Math. 6995: Reading and Research for Sujoy Mukherjee and Xiao Wang.

- Fall semester 2015:
Math. 6620: Graph Theory; Math. 6850: Knot Theory & Low-Dimensional Topology, Math 6995: Harpreet Bedi, Sujoy Mukherjee, Xiao Wang, Yang Seung Yeop Yang,

- Spring semester 2015:
Algebraic Topology, Enrollment 5.
Topics in Topology, Enrollment 4
Math. 295 (or 6995): Reading and Research ""Homological algebra for Knot Theory" for Harpreet Bedi, Sujoy Mukherjee, Xiao Wang and Seung Yeop Yang.

- Fall semester 2014:
General and Geometric Topology
Seminar: Braids and Topological Quantum Computing
Math. 295 (or 6995): Reading and Research for Seung Yeop Yang;

- Spring semester 2013:
Math. 6620-10, Graph Theory, Enrollment 8.
The innovative course connecting classical graph theory with very recent development.

- Fall semester 2012:
Math. 2009-10, Mathematical Ideas I, Enrollment 70
Math 6120 Topics in Algebra, Enrollment 4
The innovative course devoted to spectral sequences and resulting in 55 pages notes.
Math. 295: Reading and Research for Jing Wang (small categories and barycentric subdivision).

- Spring semester 2012:
  Math 1010-10; Mathematical Ideas I, Enrollment 70
  Math 6868 (old 286) (Knot Theory and Low Dimensional Topology II); Enrollment 6.
  Math. 295: Reading and Research for Jing Wang and Greg Mezera (Distributive structures);
  Math. 295: Reading and Research for Jing Wang and Greg Mezera (Homology of small categories);

- Fall semester 2011:
  Math 6850 (old 285) (Knot Theory and Low Dimensional Topology I); Enrollment 6.
  Math. 295: Reading and Research for Jing Wang and Greg Mezera (Khovanov homology and distributivity);
  Math. 295: Reading and Research for Jing Wang

- Spring semester 2011:
  Math 2233 (Multivariable Calculus); Enrollment 53
  Math 6890 (old 289; Topics in Topology); Enrollment 6.
  Math. 295: Reading and Research for Jing Wang;

- Fall semester 2010:
  Calculus with precalculus; Enrollment 70
  Math 281 (General and Geometric Topology); Enrollment 6.

- Fall semester 2009:
  Math 009-11 (Mathematical ideas I); Enrollment 70
  Math 009-12 (Mathematical ideas I); Enrollment 1 (Sean Rourke),
  Math 801: The Dean's Seminar: Geometry of Knots and Graphs: a historical perspective, Enrollment (5).
  Math. 195: Undergraduate Independent study (2 students);

- Spring semester 2009:
  Math. 10-10 (Mathematical ideas II); Enrollment 70
  Math 282 (Algebraic Topology); Enrollment 12.
  Math. 295: Reading and Research for Radmila Sazdanovic

- Fall semester 2008:
  Math. 9-13 (Mathematical ideas I); Enrollment 70
  Math 281 (General and Geometric Topology); Enrollment 8.
  Math. 295: Reading and Research for Radmila Sazdanovic.
  Math. 195: Undergraduate Independent study (1 student);

- Spring semester 2008:

Math 801: The Dean's Seminar: Geometry of Knots and Graphs: a historical perspective, Enrollment (19).

- Math. 286: Knot Theory and Low Dimensional Topology II, Enrollment (3+2)

- Reading and Research (295),

- Fall semester 2007:
  Reading and Research (295),
  Math. 9-13 (Mathematical ideas I); Enrollment 70
  Math. 285 (Knot Theory and Low Dimensional Topology), Enrollment 5.

- Spring semester 2007:
  Reading and Research (295) (with M.Pabiniak and R.Sazdanovic).

- Fall semester 2006:
  Reading and Research (295) (two courses):
  (i) Categorification of state sums; can Khovanov homology detect phase transition?
  (ii) Skein modules

- Spring semester 2006:
  The Dean's Seminar: Geometry of Knots and Graphs: a historical perspective; Enrollment 9.
  Math. 206 (Topics in Algebra: Skein modules, Khovanov homology and Hochschild homology); Enrollment 3
  Reading and Research (295), Chromatic homology for graphs as homology of cell complexes; (for M.Pabiniak, R.Sazdanovic), NEW COURSE
  Reading and Research (295), Commutative Kei (for M.Niebrzydowski), NEW COURSE

- Fall semester 2005:
  Math. 9-13 (Mathematical ideas I); Enrollment 69.
  Math. 9-14 (Mathematical ideas I); Enrollment 71.
  Reading and Research (295), Introduction to Homological algebra (for M.Niebrzydowski, M.Pabiniak, R.Sazdanovic), NEW COURSE
  Reading and Research (295), Homology of groups (for M.Niebrzydowski), NEW COURSE

- Spring semester 2005:
  Math. 282 (Algebraic Topology); Enrollment (about 4)
  Reading and Research (295) for M.Niebrzydowski.

- Fall semester 2004:
  Math. 9 (Mathematical ideas I); Enrollment 77.
  Math. 281 (General Topology); Enrollment 12.
  Reading and Research (295), Quandles (for F.Jasso-Hernandez, M.Niebrzydowski)

- Spring semester 2004:
  Reading and Research (295), (for G.Barad, F.Jasso-Hernandez, M.Niebrzydowski)

- Fall semester 2003:
  The Dean's Seminar: Geometry of Knots and Graphs: a historical perspective, NEW COURSE

- Reading and Research (295), "Temperley-Lieb algebras" (for G.Barad). NEW COURSE

- Reading and Research (295), "Burnside groups" (for G.Barad, F.Jasso-Hernandez). NEW COURSE

- Spring semester 2003:
  Math. 10 (Mathematical ideas II); Enrollment 85

- Fall semester 2002:
  Math. 9 (Mathematical ideas I); Enrollment 72.
  Math. 289 (Topics in Topology - "Rotors, Lagrangians and skein modules of Knots"
  Enrollment 4 (plus 5 other researchers), NEW COURSE
  Dissertation Research (399) (for M.Dąbkowski, M.Veve)

  - Spring semester 2002:
    Math. 10 (Mathematical ideas II); Enrollment 73
    Math. 289 (Topics in Topology - "Skein algebras, character varieties and group orderings"
    Enrollment 3 (plus 4 other researchers), NEW COURSE
    (Marta Asaeda, Mietek Dabkowski, Mike Veve and Robert Wilson)'
    Dissertation Research (399) (for M.Dąbkowski)

  - Fall semester 2001:
    Math. 9 (Mathematical ideas I); Enrollment 72.
    Dissertation Research (399) (for M.Dąbkowski)

  - Spring semester 2001:
    Math. 10 (Mathematical ideas II); Enrollment 50
    Math. 398: Advanced Reading and Research/Topics in Topology: *Knotting of ideas from algebra geometry and topology*; Enrollment 3 (plus 3 research visitors), NEW COURSE
    Math. 398: Advanced Reading and Research (for M.Dabkowski)
    (i) Noncommutative torus in Knot Theory
    (ii) Symplectic structure in knot theory
    Dissertation Research (399) (for M.Veve).

  - Fall semester 2000:
    Math. 9 (Mathematical ideas I); Enrollment 77.
    Math. 289 (Topics in Topology; From lattice knots through symplectic colorings to skein algebras); Enrollment 3. NEW COURSE
    Math. 398: Advanced Reading and Research (M.Dąbkowski)
    Character Varieties and skein modules.
    Dissertation Research (399) (for M.Veve).

- Summer semester 2000:
  Math. 10 (Mathematical ideas II); Enrollment 17.
  Math. 3 (College Algebra); Enrollment 6.

- Spring semester 1999:
  Math. 10 (Mathematical ideas II); Enrollment 57.
  Math. 289 (Topics in Topology - Topics in Algebra Situs). Enrollment 6. NEW COURSE
  Advanced Reading and Research (398) Topics in skein modules (for M.Sokolov, T.Tsukamoto and M.Veve).
  Math. 195 (Reading and Research) A group of Coxeter and 3-moves; (for Qi Chen).

- Fall semester 1998. Math 31 Single Variable Calculus I; Enrollment 70.
  Math. 138 Advanced Calculus I; Enrollment 8.
  Advanced Reading and Research (398) Topics in skein modules (for M.Sokolov, T.Tsukamoto and M.Veve).

- Spring semester 1998:
  Math. 10 (Mathematical ideas II); Enrollment 75.
  Math. 195 (Reading and Research), Simony knots and continued fractions, (for E.Grgeta).
  Math. 295 (Topics in Topology - Skein modules of manifolds). Enrollment 5. NEW COURSE
  Advanced Reading and Research (398), Moves on links and related filtered skein modules (for T.Tsukamoto).
  Advanced Reading and Research (398), Young symmetrizers and their topological quantizations. (for M.Sokolov).
  Dissertation Research (399), Structure of 3-manifold invariants coming from local skein relations. (for M.Sokolov).

- Fall semester 1997.
  Math 33 (Multi-Variable Calculus). Enrollment 39.
  Math 106; Introduction to Topology (advanced undergraduate course) Enrollment 3.
  Reading and Research (295), "A formal inverse to the Cayley– Hamilton theorem", (for A.Raischi).
  Advanced Reading and Research (398), "Topological Quantum Field Theories (TQFT) from 3-manifold invariants" (for M.Sokolov).

- Spring semester 1997.
  Math 32 (Calculus 2). Enrollment 28.
  Math. 181: The advanced undergraduate course "Research Seminar". (Scientific applications of Knot Theory. Applications to Biology, Chemistry and Physics.) Enrollment 4. NEW COURSE
  Reading and Research (295) "The second skein module of 3-manifolds". (for M.Sokolov).

- Fall semester 1996.
  Math 31 (Calculus 1). Enrollment 82.
  Math. 289. The graduate course: Topics in Topology - "Algebraic Topology based on Knots. Introduction", Enrollment 6. NEW COURSE

25

Reading and Research (295):"Skein algebras and character varieties". (for A.Sikora and M.Sokolov).

- Spring semester 1996.
  Math 31 (Calculus 1). Enrollment 67.
  Math. 282. The graduate course "Algebraic Topology". Enrollment 9.
  Reading and Research (295) "Skein module approach to Reshetikhin-Turaev-Witten and Vassiliev-Gusarov invariants" (for M.McDaniel and A.Sikora).
  Advanced Reading and Research (398) "Skein algebras of groups and skein modules of links" (for A.Sikora).

- Fall semester 1995.
  Math. 32 (Calculus 2). Enrollment 42. Math. 281; The graduate course "General Topology". Enrollment 9.
  Reading and Research (295) "Skein algebras and Topological Quantum Field Theories (for A.Sikora).

2. Five publications in educational journals (see the list of publications).

Nominations

1. Nominated for King Faisal International Prize in Mathematics, 2005.

2. Nominated for the Prize for Excellence in Academic Advising in CSAS for 1999.

3. Nominated for the Trachtenberg Prize for Teaching for 1998.

4. Nominated for a prize for Excellence in Academic Advising in Columbian School School of Art and Sciences; May 1997.

Theses supervised:

Graduate level:

(1) Joanna Kania-Bartoszyńska, (MA, Warsaw University, 1982). (She did PhD at U.C. Berkeley).

(2) Lech Kaźmierczak, (MA, Warsaw University, 1983),
Klasyfikacja nieścieśnialnych powierzchni w wiązce torusów nad okręgiem

(3) Anna Brzezińska, (MA, Warsaw University, 1985),
Thesis: Klasyfikacja nieścieśnialnych powierzchni w rozmaitościach Seiferta

(4) Jan Olszewski, (MA, Warsaw University, 1986);

(5) Adam S. Sikora (MA, GWU 1997). (He did PhD at UMCP).

(6) Qi Chen (MA, GWU 1999) Thesis: "The 3-move conjecture for 5-braids". He did PhD at SUNY at Buffalo.

(7) Tatsuya Tsukamoto (PhD, May 2000, GWU),
Thesis: "The fourth Skein module for 4-algebraic links".

(8) Maxim Sokolov (PhD, May 2000, George Washington University),
Thesis: "Quantum Invariants, Skein Modules, and Periodicity of 3-Manifolds".

(9) Mieczysław Dąbkowski (PhD, May 2003, GWU),
Thesis: "Third Skein Modules of links and Burnside groups".

(10) Mike Veve (PhD, July 2006, George Washington University,
Thesis: "Skein modules, Orderable Magmas and Billiard knots",

(11) Maciej Niebrzydowski (PhD, April 2007, George Washington University).
Thesis: "Some applications of quandles and their homology to the geometry of knots";

(12) Milena Pabiniak (MA, George Washington University, 2008); She did PhD at Cornell University.

(13) Radmila Sazdanovic (PhD November 2009, George Washington University).
Thesis: "Categorification of Knot and Graph Polynomials and the Polynomial Ring".

(14) Jing Wang (PhD May 2015, George Washington University);
Thesis Title: Homology of Small Categories and Its Applications.

(15) Seung Yeop Yang (PhD May 2017, George Washington University);
Thesis Title: Khovanov homology, distributive structure homology and applications to Knot Theory.

(16) Xiao Wang (PhD 2018, George Washington University);
Thesis Title: Knot theory and algebraic structures motivated by and applied to knots.

(17) Sujoy Mukherjee (PhD 2019, George Washington University);
Thesis Title: On Skein Modules and Homology Theories Related to Knot Theory.

(18) Rhea Palak Bakshi (PhD 2021, George Washington University);
Thesis Title: Skein Modules, Skein Algebras, and Their Ramifications.

(19) Dionne Ibarra-Kunkel (PhD 2022, Defense March, 2022; George Washington University);
Thesis Title: Framed links in 3-manifolds, its applications, and algebraic approaches to knot theory

(Co) Co-advisor in PhD thesis of Chris Lamm (1999), Makiko Ishiwata (2003), and Harpreet Bedi (2017).

PhD students, according to Mathgenealogy:

Name   School   Year   Descendants
(1) Lamm, Christoph Rheinische Friedrich-Wilhelms-Universitat Bonn 1999
(2) Sokolov, Maxim The George Washington University 2000

(3) Tsukamoto, Tatsuya The George Washington University 2000

(4) Dabkowski, Mieczyslaw The George Washington University 2003 5

(5) Ishiwata, Makiko Osaka City University 2004

(6) Veve, Michael The George Washington University 2006

(7) Niebrzydowski, Maciej The George Washington University 2007 **(8)** Sazdanovic, Radmila The George Washington University 2010 3

(9) Wang, Jing The George Washington University 2015

(10) Yang, Seung Yeop The George Washington University 2017

(11) Bedi, Harpreet The George Washington University 2018

(12) Wang, Xiao The George Washington University 2018

(13) Mukherjee, Sujoy The George Washington University 2019

(14) Bakshi, Rhea Palak The George Washington University 2021

(15) Dionne Ibarra-Kunkel (PhD 2022, defense March 2022).

(16) Gabriel Montoya-Vega (PhD 2022, defense, Summer (June 30) 2022,

(17) Ali Guo (started September 2021).

(18) Anthony Christiana (started September 2022).

(19) Ben Clingenpeel (started September 2023).

(20) Ben MacVicar (started September 2023).

Undergraduate level:

Edi Grgeta (GWU, 1998), senior thesis (special honors project).

Thesis: Simony knots and continued fractions.

LIST OF PUBLICATIONS
Józef H. Przytycki

Books

1. *Topology of 3-dimensional manifolds*, (with **W.Jakobsche**), **Warsaw University Press, (1987), in Polish, pp. 232. (Second edition, in preparation, Script, Warsaw).**

2. *Knots: a combinatorial approach to knot theory*, **Script, Warsaw, August 1995, 240+ XLVIII pp., (in Polish, English translation (extended) in preparation; to be published by Cambridge University Press in 2025 or 2026).**

3. *Knot Theory and related with knots distributive structures; Thirteen Gdansk Lectures*, **Gdansk University Press, in Polish, June, 2012, pp. 115. (Second, extended edition: twelve new Gdansk Lectures added, February 2016, pp. 188.). ISBN 978-83-7865-330-1.**

   Third edition in preparation (waits for the end of Covid Pandemia).

4. **Lectures in Knot Theory; An Exploration of Contemporary Topics (with Rhea Palak Bakshi, Dionne Ibarra, Gabriel Montoya-Vega, Deborah Weeks), Springer Universitext, Published March 18, 2024, 520 pages.**

5. **31 volumes for which I was an editor (see** *Editing***).**

Books in preparation

1. **KNOTS: From combinatorics of knot diagrams to the combinatorial topology based on knots, Cambridge University Press, accepted for publication, to appear 2025 pp. 750.**
   Chapter II, e-print: `http://arxiv.org/abs/math/0703096`
   Chapter III, e-print: `arXiv:1209.1592v1 [math.GT]`
   Chapter IV, e-print: `arXiv:0909.1118v1 [math.GT]`
   Chapter V, e-print: `http://arxiv.org/abs/math.GT/0601227`
   Chapter VI, e-print: `http://front.math.ucdavis.edu/1105.2238`
   Chapter IX, e-print: `http://arxiv.org/abs/math.GT/0602264`
   Chapter X, e-print: `http://arxiv.org/abs/math.GT/0512630`

2. *Algebraic topology based on knots*, **Series on Knots and Everything - Vol. 18, World Scientific, in preparation.**

3. *Topology of 3-dimensional manifolds*, (with **W.Jakobsche**), **Second edition, accepted for publication, Script, Warsaw, 2023. (in Polish)**

Papers published or accepted for publication

1. **Some remarks on actions of Z_n-groups on 3-manifolds,** *Bull. Ac. Pol. Scie. Ser. Math. Astr. Phys* **XXVI (7) 1978, 625 - 633.**

2. **Free actions of Z_n on handlebodies and surfaces,** *Bull. Ac. Pol. Scie. Ser. Math. Astr. Phys.,* **XXVI (7)1978, 617-624.**

3. **A unique decomposition theorem for 3-manifolds with boundary,** *Bull. Ac. Pol.: Math.,* **XXVII (2) 1979, 209-215.**

4. **Z_n-actions on some 2- and 3-manifolds, Geometric Topology, Proc. Int. Conf. Warszawa, August-September 1978, 353-359 (1980).**

5. **Z_n actions on 3-manifolds,** *Colloq. Math.* **47, 1982,199-219.**

6. **Actions of Z_n on some surface-bundles over S^1,** *Colloq. Math.* **47, 1982, 221-239.**

7. **Cyclic actions on S^2 and P^2-bundles over S^1,** *Colloq. Math.* **47, 1982, 241-254.**

8. **Incompressibility of surfaces after Dehn surgery,** *Michigan Math. J.* **30, 1983, 289-308.**

9. **Nonorientable,incompressible surfaces of genus 3 in $M_{\phi(\lambda/\mu)}$ manifolds,** *Collectanea Math* **XXXIV (1), 1983 ,37-79.**

10. **Incompressibility of surfaces with four boundary components after Dehn surgery,** *Demonstratio Math.* **XVII (1), 1984, 119-126.**

11. **Incompressible surfaces in the exterior of a closed 3 braid. I. Surfaces with horizontal boundary components (with M.Lozano),** *Math. Proc. Cambridge Phil. Soc.,* **98, 1985, 275-299.**

12. **n-relator 3-manifolds with incompressible boundary, in:** *Low-dimensional topology and Kleinian groups,* **edited by D.B.A. Epstein, London Math. Soc. LNS 112 ,1986, 273-285.**

13. **Hyperbolic structures on Dehn fillings of some punctured-torus bundles over S^1 (with S.Betley and T.Żukowski),** *Kobe J. Math.,* **3(2), 1986, 117-147.**

14. **Invariants of links of Conway type (with P.Traczyk),** *Kobe J.Math.,* **4, 1987, 115-139; e-print:** `arXiv:1610.06679 [math.GT]`.

15. **Conway algebras and skein equivalence of links (with P.Traczyk),** *Proc. Amer. Math. Soc.,* **100(4), 1987, 744-748.**

16. **t_k moves on links,** *Contemporary Math.* **Vol. 78, Braids - Proceedings of the Santa Cruz conference on Artin's braid groups (July 1986), 1988, 615-656; e-print:** `http://arxiv.org/abs/math.GT/0606633`

17. **Plans' theorem for links: An application of t_k moves,** *Canad. Math. Bull.* **31(3), 1988, 325-327.**

18. t_k-equivalence of links and Conway formulas for the Jones-Conway and Kauffman polynomials, *Bull. Polish Acad. Sci. Math.*, **36(11-12), 1988, 675-680.**

19. **On spines of knots spaces (with W.J.R.Mitchell and D.Repovs),** *Bull. Ac. Pol.: Math.*, **37, 1989, 563 - 566.**

20. **Knot polynomials and generalized mutation (with R.P.Anstee and D.Rolfsen)** *Topology and its appl.*, **32, 1989, 237-249.** e-print: `http://front.math.ucdavis.edu/math.GT/04053`

21. **An invariant of dichromatic links (with J.Hoste),** *Proc. Amer. Math. Soc.*, **105(4), 1989, 1003-1007.**

22. **On Murasugi's and Traczyk's criteria for periodic links,** *Math. Ann.*, **283, 1989, 465 - 478.**

23. **Equivalence of cables of mutants of knots,** *Canadian Journal Math.*, **XLI(2), 1989, 250-273.**

24. **The Skein polynomial of a planar star product of two links (with K.Murasugi),** *Math. Proc. Cambridge Phil. Soc.*, **106, 1989, 273-276.**

25. **Positive knots have negative signature,** *Bull. Ac. Pol.: Math.* **37, 1989, 559-562;** e-print: `arXiv:0905.0922v1[math.GT]`

26. **On lower bound for short noncontractible cycles in embedded graphs (with T.Przytycka),** *SIAM J. Discr. Math.* **3(2), 1990, 281-293.**

27. $t_3, \overline{t}_4$ **moves conjecture for oriented links with matched diagrams,** *Math. Proc. Cambridge Phil. Soc.*, **108, 1990, 55-61.**

28. **Homotopy skein modules of oriented 3-manifolds (with J.Hoste),** *Math. Proc. Cambridge Phil. Soc.*, **1990, 108, 475-488.**

29. **Skein modules of 3-manifolds,** *Bull. Ac. Pol.: Math.*; **39(1-2), 1991, 91-100;** e-print: `arXiv:math/0611797 [math.GT]`.

30. **A survey of skein modules of 3-manifolds (with J.Hoste); in Knots 90, Proceedings of the International Conference on Knot Theory and Related Topics, Osaka (Japan), August 15-19, 1990, Editor A. Kawauchi,Walter de Gruyter 1992, 363-379.**

31. **Skein module of links in a handlebody, Topology 90, Proc. of the Research Semester in Low Dimensional Topology at OSU, Editors: B.Apanasov, W.D.Neumann, A.W.Reid, L.Siebenmann, De Gruyter Verlag, 1992; 315-342.**

32. **Quantum group of links in a handlebody** *Contemporary Math: Deformation Theory and Quantum Groups with Applications to Mathematical Physics*, **M.Gerstenhaber and J.D.Stasheff, Editors, Volume 134, 1992, 235-245.**

33. **Surface triangulations with long noncontractible cycles, (with T.Przytycka);** *Contemporary Mathematics*, **147: Graph Structure Theory, 1993, 303-340.**

34. **Subexponentially computable truncations of Jones-type polynomials, (with T.Przytycka), in "Graph Structure Theory", Contemporary Mathematics 147, 1993, 63-108.**

35. **Elementary conjectures in classical knot theory, in** *Quantum Topology*, **Ed. L.J.Kauffman, R.A.Baadhio, Series on Knots and Everything - Vol.3, World Scientific, 1993, 292-320.**

36. **The $(2,\infty)$-skein module of lens spaces; a generalization of the Jones polynomial (with J. Hoste),** *Journal of Knot Theory and Its Ramifications*, **2(3), 1993, 321-333.**

37. **An index of a graph with applications to knot theory (with K.Murasugi);** *Memoirs of the American Math. Soc.*, **Vol. 106, Number 508, November 1993, 101 pages.**

38. **Vassiliev-Gusarov skein modules of 3-manifolds and criteria for periodicity of knots, Low-Dimensional Topology, Knoxville, 1992 ed.: Klaus Johannson International Press Co., Cambridge, MA 02238, 1994, 143-162.**

39. **A note on the Lickorish-Millett-Turaev formula for the Kauffman polynomial,** *Proc. Amer. Math. Soc.*, **121(2), 1994, 645-647;**

40. **The skein module of genus 1 Whitehead type manifolds (with J.Hoste),** *Journal of Knot Theory and Its Ramifications*, **4(3), 1995, 411-427. The Kauffman bracket skein module of $S^1 \times S^2$ (with J.Hoste),** *Math. Z.*, **220(1), 1995, 63-73.**

41. **The Kauffman bracket skein module of $S^1 \times S^2$ (with J.Hoste),** *Math. Z.*, **220(1), 1995, 63-73.**

42. **Search for different links with the same Jones' type polynomials: Ideas from graph theory and statistical mechanics, Panoramas of Mathematics, Banach Center Publications, Vol. 34, Warszawa 1995, 121-148. e-print:** `http://front.math.ucdavis.edu/math.GT`

43. **An elementary proof of the Traczyk-Yokota criteria for periodic knots,** *Proc. Amer. Math. Soc.*, **123, 1995, 1607–1611.**

44. **A simple construction of high representativity triangulations, (with T.Przytycka);** *Discrete Mathematics*, **173, 1997, 209-228.**

45. **Index of graphs and non-amphicheirality of alternating knots (with K.Murasugi), Progress in knot theory and related topics, Travaux en Cours, 56, Hermann, Paris, 1997; 20-28.**

46. **Algebraic topology based on knots: an introduction,** *Knots 96*, **Proceedings of the Fifth International Research Institute of MSJ, edited by Shin'ichi Suzuki, World Scientific Publishing Co., 1997, 279-297.**

47. **Tangle surgeries which preserve Jones-type polynomials (with J.Hoste),** *International Journal of Mathematics*, **8, 1997, 1015–1027.**

48. **A q-analogue of the first homology group of a 3-manifold,** *Contemporary Mathematics* **214, Perspectives on Quantization (Proceedings of the joint AMS-IMS-SIAM conference on Quantization, Mount Holyoke College, 1996); Ed. L.A.Coburn, M.A.Rieffel, AMS 1998, 135-144.**

49. **3-coloring and other elementary invariants of knots, Banach Center Publications, Vol. 42,** *Knot Theory*, **Warsaw, 1998, 275-295;**
    e-print: `http://arxiv.org/abs/math.GT/0608172`

50. **Skein algebra of a group (with A.S.Sikora), Banach Center Publications, Vol. 42,** *Knot Theory*, **1998, 297-306.**

51. **Lissajous knots and billiard knots (with V.F.R.Jones), Banach Center Publications, Vol. 42,** *Knot Theory*, **1998, 145-163.**

52. **Symmetric knots and billiard knots, Chapter 20 of the book** *Ideal Knots*, **Vol. 19 in Series on Knots and Everything, Ed. A.Stasiak, V.Katrich, L.Kauffman, World Scientific, 1999, 374-414. e-print:** `http://front.math.ucdavis.edu/math.GT/0405151`

53. **Fundamentals of Kauffman bracket skein modules,** *Kobe Math. J.*, **16(1), 1999, 45-66. e-print:** `arXiv:math/9809113 [math.GT]`

54. **Multiplicative structure of Kauffman bracket skein module quantizations (with D. Bullock),** *Proc. Amer. Math. Soc.*, **128(3), 2000, 923–931.**
    e-print: `http://front.math.ucdavis.edu/math.QA/9902117`

55. **On Skein Algebras and $Sl_2(C)$-Character Varieties, (with A.S.Sikora),** *Topology*, **39(1), 2000, 115-148; e-print:** `http://front.math.ucdavis.edu/q-alg/9705011`

56. **Estimating the Size of Skein Homologies (with J.Kania-Bartoszyńska and A.S.Sikora), Knots in Hellas' 98; The Proceedings of the International Conference on Knot Theory and its Ramifications; Volume 1. In the Series on Knots and Everything, Vol. 24, September 2000, pp. 138-142.**

57. **The Kauffman bracket skein module of a connected sum of 3-manifolds,** *Manuscripta Math.*, **101(2), 2000, 199–207;**
    e-print: `http://front.math.ucdavis.edu/9911.5120`

58. **Polygon dissections and Euler, Fuss, Kirkman and Cayley numbers (with A.S.Sikora),** *Journal of Combinatorial Theory - series A*, **92, 2000, 68-76;**
    e-print: `http://arxiv.org/abs/math.CO/9811086`

59. **Homotopy and q-homotopy skein modules of 3-manifolds: an example in Algebra Situs; In:** *Knots, Braids, and Mapping Class Groups: Papers dedicated to Professor Joan Birman*, **Ed. J. Gilman, W. Menasco, and X.-S. Lin, International Press., AMS/IP**

Series on Advanced Mathematics, Vol 24, Co., Cambridge, MA, 2001, 143-170.
e-print: `http://front.math.ucdavis.edu/math.GT/0402304`

60. Kanenobu-Miyazawa conjecture and the Vassiliev-Gusarov skein modules based on mixed crossings (with K.Taniyama), *Proc. Amer. Math. Soc.*, **129(9)**, **2001, 2799-2802.**

61. The fourth skein module and the Montesinos-Nakanishi conjecture for 3-algebraic links (with T.Tsukamoto), *J. Knot Theory Ramifications*, **10(7)**, **2001, 959–982;**
e-print: `http://front.math.ucdavis.edu/math.GT/0010282`

62. Surgeries on periodic links and homology of periodic 3-manifolds (with M.Sokolov),
Math. Proc. Cambridge Phil. Soc., **131(2) 2001, 295-307;** e-print: `http://front.math.ucdavis.ed`

63. Topological Insights from the Chinese Rings (with A.S.Sikora), *Proc. Amer. Math. Soc.*, **130(3), 2002, 893–902;** e-print: `math.GT/0007134`

64. The topological interpretation of the core group of a surface in S^4 (with W. Rosicki), *Canad. Math. Bull.*, **45(1), 2002, pp. 131-137;** e-print: `http://arxiv.org/abs/math.GT/`

65. Burnside obstructions to the Montesinos-Nakanishi 3-move conjecture, (with M.K. Dąbkowski), *Geometry and Topology*, **6, June, 2002, 355-360;**
e-print: `http://front.math.ucdavis.edu/math.GT/0205040`

66. 3-manifold invariants and periodicity of homology spheres, (with P.Gilmer and J.Kania-Bartoszynska), *Algebraic and Geometric Topology* **2, 2002, 825-842;**
e-print: `http://xxx.lanl.gov/abs/math.GT/9807011`

67. Skein module deformations of elementary moves on links; Geometry and Topology Monographs Volume 4: *Invariants of knots and 3-manifolds (Kyoto 2001)*, **2002 (published November 2003), 313-335.** `http://www.maths.warwick.ac.uk/gt/GTMon4/paper21.abs.htm`

68. Skein modules; Section 4 in "Problems and invariants of knots and 3-manifolds", Geometry and Topology Monographs Volume 4: *Invariants of knots and 3-manifolds (Kyoto 2001)*, **2002 (published June 1, 2004), 73-82;**
e-print: `http://arxiv.org/abs/math.GT/0406190`

69. Symmetry of links and classification of lens spaces (with A.Yasuhara), *Geometriae Dedicata*, **April 2003, Volume 98, Issue 1, 57-61;**
e-print: `http://arxiv.org/abs/math.GT/0011119`

70. SU_n-quantum invariants for periodic links (with A.S.Sikora), the AMS volume on *Diagrammatic Morphisms and Applications*, **Contemporary Mathematics, 318, 199-205, 2003.**

71. Branched covers of tangles in three-balls (with M.Ishiwata and A.Yasuhara), *Canad. Math. Bull.*, **46(3), 2003, 356–364.** e-print: `http://front.math.ucdavis.edu/0109.5046`

72. **Kauffman-Harary Conjecture holds for Montesinos knots, (with M.M.Asaeda and A.S.Sikora),** *J. Knot Theory Ramifications*, **13(4), June, 2004, 467-477;**
e-print: `http://front.math.ucdavis.edu/math.GT/0305415`

73. **Linking numbers in rational homology 3-spheres, cyclic branched covers and infinite cyclic covers (with A.Yasuhara),** *Trans. Amer. Math. Soc.*, **356 (9), 2004, 3669-3685.**
Published electronically (posted January 16, 2004) : http://www.ams.org/tran/0000-000-00/S0002-9947-04-03423-3/home.html e-print: `http://front.math.ucdavis.edu/math.GT/`

74. **From 3-moves to Lagrangian tangles and cubic skein modules,** *Advances in Topological Quantum Field Theory*, **Proceedings of the NATO ARW on New Techniques in Topological Quantum Field Theory, Kananaskis Village, Canada from 22 to 26 August 2001; John M. Bryden (ed), October 2004, 71-125;**
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(1) Oberwolfach extended abstracts:
(i) Progress in distributive homology: from q-polynomial of rooted trees to Yang-Baxter homology, in *Mathematisches Forschungsinstitut Oberwolfach – Oberwolfach reports* - Algebraic Structures in Low-Dimensional Topology, Report No. 26/2014, Vol. 11 No. 2 , 2014, 1449-1453;
e-print: `arXiv:1406.6499 [math.GT]`

(ii) Distributivity versus associativity in the homology theory of algebraic structures, in *Mathematisches Forschungsinstitut Oberwolfach – Oberwolfach Reports* - Invariants in Low-Dimensional Topology and Knot Theory, Report No. 28/2012, Vol.9 No. 2, 1719–1722;
(iii) Invariants in low-dimensional topology. Abstracts from the workshop held May 4–10, 2008. Organized by Louis Kauffman, Simon King, Vassily Manturov and Jozef Przytycki. Oberwolfach Reports, 5(2), 2008,
2007
A classification of links up to 5-move equivalence (with M.Dabkowski and M.Ishiwata); Proceeding of "Topology of Knots X" conference at Tokyo Woman Christian University (TWCU), December 25, 2007, 7 pages (in Japanese).
2005
Rational moves and tangle embeddings: $(2,2)$-moves as a case study (with Mieczysław K. Dąbkowski and Makiko Ishiwata), *Proceedings of the Conference Topology of Knot VII* (held at TWCU, December 23-26), February, 2005, 37-46, in Japanese;
e-print (in English): `http://arxiv.org/abs/math.GT/0501539`

(1999-2004)

1. q-homotopy skein module of 3-manifolds; properties and applications. *Abstracts AMS*, **20(3)**, 1999.

2. Homotopy quantization of skein modules. *Abstracts AMS*, **20(3)**, 1999.

3. The Kauffman bracket skein algebra of a surface times the interval has no zero divisors. Proceedings of the 46th Japan Topology Symposium at Hokkaido University

(July 26–29, 1999), 1999, pp.52-61.

4. **Little and Haseman – early American tabulators of knots.** *Abstracts AMS*, **20(4)**, **1999.**

5. **The fourth skein module and Montesinos Nakanishi-Conjecture for 3-algebraic links (with T.Tsukamoto), Proceedings of the Conference "Topology of Knots", TWCU, Tokyo, February, 2000, p. 55-59.**

6. **Are the Reshetikhin-Turaev-Witten invariants determining the holonomy map of a hyperbolic 3-manifold?** *Abstracts AMS*, **21(2)**, **2000.**

7. **Articles for** *Encyclopaedia of Mathematics*, **Supplement II. Ed. M.Hazewinkel; Kluwer Academic Publishers, 2000:**

(i) **Algebra Situs, p. 24.**

(ii) **Algebraic Topology Based on Knots, p.26.**

(iii) **Kauffman polynomial, pp. 289-290.**

8. **Symplectic structure on Colorings and Lagrangian tangles,** *Abstracts AMS*, **21(4)**, **December, 2000, p.545.**

9. **Symplectic structure on colorings of tangles,** *Abstracts AMS*, **21(4)**, **December, 2000, p.588.**

10. **Problem 10846,** *The American Mathematical Monthly*, **108(1)**, **January 2001, p.77, (solutions in 109(1), 2002, 79-80).**

11. **Symplectic form on t-colorings of tangles.** *Abstracts AMS*, **22(2)**, **2001, p. 383.**

12. **Lagrangian approximation of Fox p-colorings of tangles; Fox approximation of rational $\frac{p}{q}$-moves,** *Abstracts AMS*, **22(3)**, **2001.**

13. **Three talks in Cuautitlan under the general title: Topologia algebraica basada sobre nudos, Proceedings of the First International Workshop on "Graphs – Operads – Logic, Cuautitlan, Mexico, March 12-16, 2001, (in Spanish). Publiciationes Preliminares (Preprint) 717, Instituto de Matemáticas Universidad Nacional Autónoma de México, Fecha de reecibido: 7 de mayo de 2002; Presentado por Micho Durdevich.**
(e-print: `http://front.math.ucdavis.edu/math.GT/0109029`)
The Spanish translation was published under the title: "Topologa algebraica basada en nudos", 2010. *Matemàticas: Enseanza Universitaria*, **Volume XXVIII (2), 2010, 1-30.**

13. *Encyclopaedia of Mathematics*, **Supplement III. Ed. M.Hazewinkel; Kluwer Academic Publishers, 2002; 25 articles; in particular:**

(i) **Alexander-Conway polynomial, p.29.**

(ii) Alexander theorem on braids, p.29.

(iii) Brandt-Lickorish-Millett-Ho polynomial, p.82.

(iv) Conway algebra, pp.112-113.

(v) Conway skein equivalence, p.113.

(vi) Conway skein triple, p.113.

(vii) Drinfeld-Turaev quantization, pp.133-134.

(viii) Fox n-coloring, p.162.

(ix) Homotopy polynomial, p.194.

(x) Jaeger Composition Product, p.217.

(xi) Jones-Conway polynomial, pp.219-221.

(xii) Jones unknotting conjecture, pp.221-222.

(xiii) Kauffman bracket polynomial, pp.226-227.

(xiv) Listing polynomials, pp.240-241.

(xv) Markov's braid theorem, p.251.

(xvi) Milnor's unknotting conjecture, p.261.

(xvii) Montesinos-Nakanishi conjecture, pp.264-265.

(xviii) Positive link, p.308.

(xix) Reidemeister Theorem, pp.327-328.

(xx) Rotor, pp.337-338.

(xxi) Skein Module, pp.368-369.

14. **Polynomial time complexity algorithm for computing coefficients of the Jones-Conway (Homflypt) and Kauffman polynomials of links,** *Abstracts AMS*, **23(1), 2002, p.147.**

15. **Presentations od Skein Algebras,** *Abstracts AMS*, **23(2), 2002.**

16. **Branched covers of tangles in three-balls (with M.Ishiwata and A.Yasuhara), in Japanese, Proceedings of the conference dedicated to S.Suzuki and T.Kobayashi on their 60th birthday, Tokyo, 2002, 157-164.**

17. **Symmetry of links and classification of lens spaces (with A.Yasuhara), in Japanese, Proceedings of the conference dedicated to S.Suzuki and T.Kobayashi on their 60th birthday, Tokyo, 2002, 165-169,**

18. **Burnside group of a link as an obstructions to the Montesinos-Nakanishi 3-move conjecture (with M. Dąbkowski),** *Abstracts AMS*, **23(2), June 2002.**

19. **Rational moves on links measured by Burnside type groups (with M. Dąbkowski),** *Abstracts AMS*, **23(2), June 2002.**

20. **Burnside obstruction to the Montesinos-Nakanishi 3-move conjecture.** Proceedingas of the conference "Topology in Matsue" (June 24-28, 2002).

21. **4-moves and 4th Burnside group of links: Nakanishi and Kawauchi conjectures (with M. Dąbkowski),** *Abstracts AMS*, **23(4), 2002.**

22. **Number theoretical criterion for invariance of Fox p-colorings under n-rotation.** *Abstracts AMS*, **24(1), 2003.**

23. **Variety of groups of knots (with M. Dąbkowski),** *Abstracts AMS*, **24(2), 2003.**

24. **Derived group of a link group: three applications (with M. Dąbkowski),** *Abstracts AMS*, **24(2), 2003.**

25. **Khovanov homology of links in I-bundles over surfaces (with M.M.Asaeda and A.S.Sikora), Report No. 46/2003, Mathematisches Forschungsinstitut Oberwolfach, p. 4.**

26. **Rotation and signature invariants (with M. Dąbkowski, M. Ishiwata and A,Yasuhara), e-abstract (July 2004): http://www.math.kobe-u.ac.jp/HOME/nakanisi/KOOKseminarIN**

27. **Khovanov graph homology as a Hochschild homology of graphs,** *Abstracts of AMS*, **26(4), 2005**

28. **Confluence of Khovanov homology and Hochschild homology,** *Abstracts of AMS*, **27(1), p.157, 2006.**

29. **5-move equivalence for links up to 9-crossings (with M.Ishiwata and M.K.Dabkowski), Extended abstract/slides Osaka, November 2005: http://pal.las.osaka-sandai.ac.jp/ math/TopComp2005/TC2005programE.html http://pal.l sandai.ac.jp/ math/TopComp2005/Slides/ishiwata.pdf**

30. **Supersignature and the unknotting number, (with P.Traczyk),** *Abstracts of AMS*, **1991.**

31. **Almost positive links have negative signature (with K. Taniyama) ,** *Abstracts of AMS*, **June 1991, Issue 75, Vol. 12(3), p.327.**

Selected Invited Talks

1. University Seminar/Logic-Topology Seminar, February 7, 2024, George Washington University,
   Title: From the Kauffman bracket polynomial to cubic skein modules and beyond.

2. Colloquium; University of Texas at Dallas, September 27, 2023;
   Title: The story of Fox colorings of knots: the Kauffman-Harary Conjecture and beyond.

3. Logic-Topology seminar at GWU, September 20, 2023;
   Title: The story of Fox colorings of link diagrams: the Kauffman-Harary Conjecture and beyond

4. Special Session of AMS on "From Classical to Quantum Low-Dimensional Topology", AMS Fall Eastern Sectional Meeting, September 9-10, 2023 (Saturday - Sunday) University at Buffalo (SUNY), Buffalo, NY Meeting #1188, Abstract Issue: 44/3
   Title: Alexander modules and Burau representations of wheel diagrams.

5. The conference and workshop: "LOOPS'23 conference", Bedlewo, June 26- July 1, 2023, Plenary Workshop Talks;
   Talk 1: 09:30 - 11:00, June 27 Talk title: Homology of Yang-Baxter operations I: From quandle homology to Yang-Baxter homology Talk 2: 09:30 - 11:00, June 28 Talk title: Homology of Yang-Baxter operations II: Y-B operator of HOMFLYPT polynomial.

6. Geometry-Topology seminar at University of Gdansk, June 21, 2023. Title: Learning with Khovanov: Foams and categorification

7. Special Session of AMS on "Algebraic Structures in Knot Theory",
   AMS Spring Western Sectional Meeting, May 6-7, 2023 (Saturday - Sunday) California State University, Fresno, Fresno, CA, Meeting # 1187, Abstract Issue: 44/3
   Title: Complexity of Khovanov homology: n-moves and extreme grades.

8. Special Session of AMS on "Inverse Problems (Code: SS 5A)
   AMS Spring Western Sectional Meeting, May 6-7, 2023 (Saturday - Sunday) California State University, Fresno, Fresno, CA, Meeting # 1187, Abstract Issue: 44/3
   Title: Mathematics of Mathathons at GWU

9. Special Session of AMS on "Combinatorial and Geometric Knot Theory" (Code: SS 11A)
   Spring Central Sectional Meeting, University of Cincinnati, Cincinnati, OH,
   April 15-16, 2023 (Saturday - Sunday), Meeting # 1186, Abstract Issue: 44/2
   Title: The story of the Kauffman-Harary Conjecture on Fox colorings of link diagrams, its generalizations and Mathathoners proof of these generalizations.

10. Colloquium, University of Denver, February 22, 2023;
    Title: Title: Khovanov homology: introduction and modern results.

11. Algebra-Logic seminar, University of Denver, February 22, 2023;
    Title: The story of the Kauffman-Harary Conjecture on Fox colorings of link diagrams, its generalizations and Mathathoners proof of these generalizations.

12. Geometry-Topology seminar at University of Gdansk, January 23, 2023,
    Title: The story of the Kauffman-Harary Conjecture on Fox colorings of link diagrams, its generalizations and its proof.

13. Special Session on "Inverse Problems"
    Fall Western Sectional Meeting University of Utah, Salt Lake City, UT October 22-23, 2022 (Saturday - Sunday) Meeting #1182;
    Title: Khovanov adequate links and their crossing numbers

14. Logic-Topology seminar at GWU, October 3, 2022 (In person);
    Title: Complexity in Knot Theory.

15. Two talk at a worksiop at Biology institute, Warsaw July 26, 2022:
    (1) Tait diagrams from signed planar graphs,
    (2) Plucking polynomials with delay functions.

16. "Inverse Problems" conference (online);
    Title: Extreme Khovanov homology of 4-braids in polynomial time,

17. Special Session on "Inverse Problems"
    July 18 - 22, 2022, Grenoble, France AMS-SMF-EMS Joint International Meeting,
    Title: Extreme Khovanov homology of 4-braids in polynomial time,
    Cancelled and replaced by online meeting (as above).

18. The Fourth W. Killing and K. Weierstrass Colloquium (Gdansk-Braniewo conference (organized by Andrzej Szczepanski)), July 22, 2022
    Title: Khovanov homology and its complexity

19. The conference "Yang-Baxter operators" in Bedlewo 2022"; July 10-14, 2022, Plenary Talk;
    Title: From Bin(X) to Yang-Baxter homology

20. The conference "Applied Topology" in Bedlewo 2022"; July 3-8 2022 Plenary Talk;
    Title: Complexity of finding Khovanov homology: the case of 4-braids

21. Conference: From Subfactors to Quantum Topology - In memory of Vaughan Jones;
    June 27 - July 1; Geneva, Switzerland; short, 5 minutes presentation;
    Title: Vaughan Jones and Knotted antennas,

22. **Geometry seminar at University of Gdansk, June 1, 2022;**
Zlozonosc obliczeniowa homologii Chowanowa II: Skrajne homologie i kompleks symplicjalny grafow okregowych. (Complexity of Khovanov homology II: extreme homology and simplicial complex of circle graphs).

23. **Richmond Geometry Festival (online) May 27-28, 2022; Plenary Talk, Friday May 27;. Title: Extreme Khovanov homology of 4-braids in polynomial time**

24. **Geometry seminar at University of Gdansk, May 25, 2022;**
Zlozonosc obliczeniowa homologii Chowanowa.
(Complexity of Khovanov homology).

25. **Matemale: Conference on Witten Conjecture on Kauffman bracket skein modules, May 16-20 Kauffman bracket skein module of lens spaces and the complement of the trivial link of two components.**

26. **Joint Mathematics Meetings (JMM); Washington State Convention Center and the Sheraton Grand Seattle Hotel, Seattle, WA January 5-8, 2022 (Wednesday - Saturday); (Postponed due to Covid pandemic);**
AMS Special Session on Skein Theory and Quantum Algebra; Cancelled
Title: Skein modules of $S_{(n+1)/2,\infty}$-type and Fox n-colorings.

27. **Special Session on "Inverse Problems"**
October 23-24, 2021 (Saturday - Sunday) now meeting virtually, PDT (hosted by the American Mathematical Society), Albuquerque, NM (Fall Western Sectional Meeting (formerly at University of New Mexico);
Computational complexity of finding geometric realization of Khovanov homology.

28. **Logic-Topology seminar at GWU, September 22, 2021 (In person);**
Complexity of the Jones polynomial and Khovanov homology.

29. **International Conference: Applied Category Theory Graph-Operad-Logic (GOL 2021); in memoriam Zbigniew Oziewicz;**
August 24-26, 2021 (Zoom conference).
Skein modules and algebras of links in 3-manifolds; August 25 (Keynote Speaker).

30. **The 12th TAPU-KOOK Joint Seminar on Knots and Related Topics, July 27-29, 2021; PLENARY TALK (July 27), meeting virtually**
Computing extreme parts of Khovanov homology of 3- and 4-braids in polynomial time.

31. **Virtual Workshop "Entanglement days of biopolymers" (https://knot2021.cent.uw.edu.pl/); Online, June 22-26, 2021**
Invited talk: Teoria węzłów w historycznej perspektywie (Knot Theory in historical perspective).

32. **Maththon VI: "Searching for short skein relations for Fox p-colorings", April-May 2021**

33. **Winter school, mini course, March 3,4,10,11, 2021, JLU, China (online).**
Series of 4 talks under the general title:
Modern Knot Theory in the Historical perspective:

   (1) Tait's graphs and knots. Adjacency matrix of graphs and Goeritz matrix of knots.

   (2) From Seifert matrix and Seifert form to Alexander-Conway polynomial and Tristram-Levine signatures.

   (3) From Fox 3-coloring to Yang-Baxter homology.

   (4) Introduction to Khovanov homology: from enhanced Kauffman states to applications of the long exact sequence of homology.

34. **2021 Winter TAPU Workshop on Knots and Related Topics, January 14-15, 2021, Daegu, Korea;**
Online workshop via Zoom;
New homology in knot theory − 42 months after Daegu series of talks for students

35. **kpa70: Conference celebrating the 70th birthday of Prof. Krzysztof Pawałowski (plenary talk);**
11-13 January 2021, Online conference via Zoom;
Adventures of Knot Theorist: from Fox 3-colorings to Yang-Baxter homology− 5 years after Poznań talks.

36. **Joint Mathematics Meetings (JMM), January 6-9, 2021 (online) AMS Special Session on Knotty Problems in Geometry: Special Session in Memory of Mark E. Kidwell,**
Motivated by Mark Kidwell - from Hoste-Kidwell multivariable HOMFLYPT polynomial to Witten conjecture.

37. **Topology Seminar at Warsaw University (online), December 22, 2020,**
What is new in skein modules of 3-manifolds? − Personal perspective.

38. **Special session on "Inverse Problems"**
October 24-25, 2020 (Saturday - Sunday) Fall Western Sectional Meeting (formerly at University of Utah) now meeting virtually, PDT (hosted by the American Mathematical Society). Remarkable closed formula in Temperley-Lieb algebra.

39. **ICTS (India) online program on "Knots through web" held over zoom August 24-28, 2020; two lectures:**
Lecture 1 (Aug. 26).
Introduction to Khovanov homology: from enhanced Kauffman states to applications of the long exact sequence of homology.
Lecture 2 (Aug 27).
From Fox 3-coloring to Yang-Baxter homology.

40. Special session on "Algebraic Structures in Knot Theory"
    AMS Spring Western Sectional Meeting in Fresno, CA
    May 2-3, 2020 (Saturday - Sunday); Invited,
    CANCELLED
    Computing Yang-Baxter homology.

41. Special session on "Inverse problems"
    AMS Spring Western Sectional Meeting in Fresno, CA
    May 2-3, 2020 (Saturday - Sunday); Invited,
    CANCELLED
    Complexity of extreme Khovanov homology for 4-braids.

42. Special session on "Knots and Links in 3-Manifolds"
    AMS Spring Central Sectional Meeting,
    Purdue University, West Lafayette, IN, April 4-5, 2020; Invited,
    CANCELLED
    Knot theory problems in Mathathon: past and future.

43. The conference "Trends in Knot Theory" at Bangalore, India, March 30, 2020;
    Homology of stochastic Yang-Baxter operators.
    CANCELLED due to Coronavirus Pandemic (or rather rescheduled for 2021).

44. The conference "Trends in Knot Theory" at Bangalore, India
    Date and time: March 23, 2020 to April 3, 2020, (https://www.icts.res.in/program/knots202
    Title of the series of talks:
    Khovanov homology and Yang-Baxter homology: five adventures of Knot Theorist
    in the word of homological algebra

    (1) From Fox 3-coloring to Yang-Baxter coloring.
    (2) The Kauffman bracket polynomial and its categorification by Khovanov.
    (3) (Pre)simplicial and (pre)cubic categories; geometric realizations; homology of
        small categories with coefficients in functors.
    (4) Associative (e.g. Hochschild), distributive (e.g. quandle) and Yang-Baxter
        homology.
    (5) Future directions and open problems; e.g. how to relate Khovanov homology
        with Yang-Baxter homology?

    CANCELLED (or rather rescheduled for 2021?), see also online conference in
    August 2020 (above).

45. Colloquium at University of South Florida at Tampa, February 28, 2020;
    What is Yang-Baxter homology and how to compute it?

46. Talk directed toward graduate students at University of South Florida at Tampa,
    February 27, 2020;
    Finite topological spaces and their coverings.

47. **Knots in Washington XLIX; In memory of Mark Kidwell (1948–2019),**
    George Washington University; February 7–9, 2020.
    The second homology of Homflypt Yang-Baxter operators

48. **Special session of AMS on "Self-Distributive Structures, Knot Theory, and the**
    Yang-Baxter Equation" at Joint Mathematics Meetings Colorado Convention Center, Denver, CO January 15-18, 2020 (Wednesday - Saturday)
    Two-(co)cycle invariants of links from column unital Yang-Baxter operators.

49. **The special session of AMS on"Invariants of Knots and Spatial Graphs" at the**
    AMS Fall Western Sectional Meeting University of California, Riverside, Riverside,
    CA November 9-10, 2019 (Saturday - Sunday) Meeting #1153;
    The Kauffman bracket skein module of the connected sum of two solid tori

50. **The special session of AMS on "Inverse Problems" at the AMS Fall Western**
    Sectional Meeting University of California, Riverside, Riverside, CA November
    9-10, 2019 (Saturday - Sunday) Meeting #1153;
    Computational complexity of Khovanov homology.

51. **Colloquium, University of Texas at Dallas, October 26, 2019;**
    Gram Determinants in Knot Theory.

52. **Seminar on Geometry, Topology and Dynamical Systems, University of Texas at**
    Dallas, October 21, 2019;
    Extensions and (co)homology in universal algebra; Bosbach-Rump magma as a
    case study.

53. **Special session "Invariants of Knots, Links, and Low-dimensional Manifolds" at**
    the AMS Fall Eastern Sectional Meeting, October 12-13, 2019 (Saturday - Sunday)
    Binghamton University, Binghamton, Meeting # 1151, Abstract Issue: 40/3;
    Homology of Yang-Baxter operator yielded by Alexander numbering.

54. **Logic-Topology seminar at GWU, September 20, 2019;**
    Gram determinants and Temperley-Lieb algebras.

55. **The special session "Borsuk and Eilenberg" devoted to topology, geometry, and**
    homological algebra, at the Jubilee Congress of Polish Mathematicians in the centenary of PTM,
    Kraków, September 3-7, 2019;
    Czy złożoność obliczeniowa homologii Khovanova warkoczy o danej liczbie pasm
    jest wielomianowa? (Is the computational complexity of finding Khovanov homology of closed braids of given number of strings, polynomial?)

56. **Colloquium, Pusan National University, Busan, Korea, July 23, 2019,**
    Knot Theorist adventures in the word of homological algebra.

57. **Topology Seminar, Kyungpook National University (KNU, Daegu, Korea), July**
    18 2019,
    Ten problems in Knot Theory.

58. **Special Algebraic Topology Seminar, University of Warsaw, July 4, 2019,**
    Gram determinants motivated by Knot Theory.

59. **Knots in Gdansk III conference, June 17-19, 2019; Plenary Talk; Second quandle**
    homology and Schur multiplier (from Takasaki kei to Alexander quandle)

60. **Geometry and Toplogy Seminar, May 29, 2019, University of Gdansk,**
    Wyznaczniki Grama w teorii węzłów (Gram determinants in Knot Theory).

61. **Knots in Washington XLVIII: , May 10-12, 2019, George Washington University;**
    Second quandle homology from Schur multiplier (the historical perspective).

62. **Graduate Student Seminar, GWU, March 29, 2019;**
    Coloring knot diagrams in Yang-Baxter way.

63. **The AMS Spring Central and Western Joint Sectional Meeting University of**
    Hawaii at Manoa, Honolulu, HI; March 22-24, 2019 (Friday - Sunday) Meeting
    #1147; Special session "Special Session on Algebraic and Combinatorial Struc-
    tures in Knot Theory";
    Second quandle homology from Schur multiplier.

64. **Hidden Algebraic Structures in Topology; workshop; Caltech, March 13-16, 2019;**
    Leading (with Thang Le) the problem session on Skein modules, quantum invari-
    ants of 3-manifolds and categorification.

65. **Kavli Institute for Theoretical Physics, November 14-21, 2018;**
    The Kavli Institute for Theoretical Physics in Santa Barbara is organizing the
    program, Quantum Knot Invariants and Supersymmetric Gauge Theories. It
    runs from November 5 - December 14, 2018 and is coordinated by Sergei Gukov,
    Mikhail Khovanov, Andrew Lobb, Piotr Sułkowski, and Cumrun Vafa. Web site:
    https://www.kitp.ucsb.edu/activities/knot18.
    Title of the talk: Progress in Yang-Baxter homology.

66. **The AMS Sectional Meeting at the University of Arkansas, Fayetteville, AR,**
    November 3-4, 2018, Meeting #1142. The special session: "Non-associative al-
    gebraic structures and their (co)homology theories";
    The second Yang-Baxter homology of the Homflypt polynomial of links

67. **Colloquium, University of Texas at Dallas, October 5, 2018;**
    Kauffman bracket skein algebra of a thickened 4-punctured sphere and Witten's
    positivity conjecture.

68. **Logic-Topology seminar at GWU, September 21, 2018;**
    Multiplying fractions in a topological way.

69. **Seminar at the University of Barcelona, July 9, 2018, Skein algebras and positivity**
    of structure constants.

70. **Knots in Gdansk II conference, June 14-15, 2018;**
    Kauffman bracket skein modules and algebras. Plenary Talk

71. **Toplogy Seminar, June 6, 2018, University of Gdansk,**
    Dodatnіość, w bazach Czebyszewa, iloczynu algebr motkowych (Positivity, in Chebyshev basis, of a product in skein algebras).

72. **The sixteenth Andrzej Jankowski Memorial Lecture and conference; Mathematical Institute of Gdansk University, Gdansk Branch of the Mathematical Institute, Polish Academy of Sciences, May 18-19, 2018,**
    Strict unimodality of plucking polynomials of rooted trees.

73. **Knots in Washington XLVI: 70th Birthday of Oleg Viro, May 4-6, 2018, George Washington University;**
    Learning from the masters: four lessons from Oleg.

74. **Southern California Topology Conference in honor of the retirement of Jim Hoste, April 21st, 2018, Plenary talk;**
    Skein modules of 3-manifolds in historical perspective.

75. **AMS meeting April 14-15, 2018, Portland State University, Portland, OR, Meeting #1137; Special session on "Algebraic and Combinatorial Structures in Knot Theory", How to define homology for non-associative structures.**

76. **AMS meeting April 14-15, 2018, Portland State University, Portland, OR, Meeting #1137; Special session on "Inverse Problems", Kauffman Bracket Skein Algebras: Old and New.**

77. **AMS meeting March 17-18, 2018, Ohio State University (OSU), Columbus, OH, Meeting #1136; Special session on "Algebraic, Combinatorial, and Quantum Invariants of Knots and Manifolds";**
    Geometric realization of transition Khovanov homology.

78. **Aspen Center for Physics, Conference "Quantum Knot Homology and Supersymmetric Gauge Theories", March 4-10, 2018,**
    From distributive to Yang-Baxter homology, March 9, 2018.

79. **General Algebra Seminar, Warsaw Technical University, Warsaw, Poland, February 9, 2018;**
    Homology of nonassociative structures: similarity with and differences from homology of semigroups.

80. **Algebraic Topology Seminar, Warsaw University, Warsaw, Poland, February 8, 2018;**
    "Product to sum formula in skein modules" ("Formula zmieniajaca iloczyn na sume w modulach motkowych").

81. **Colloquium, University of Denver, November 17, 2017;**
    Knot Theory from Fox 3-coloring to Yang-Baxter Homology.

82. Colloquium, University of Texas at Dallas, October 6, 2017;
Knot Theorist adventures in the word of homological algebra.

83. Logic-Topology seminar at GWU, October 5, 2017;
Mathathon II: search for interesting torsion in Khovanov homology.

84. Plenary talk at Forum of Polish Mathematicians, the main annual meeting of the Polish Mathematical Society (PTM), Lublin Poland, 18-22 September 2017,
Teorio-węzłowiec w krainie algebry homologicznej (Knot Theorist in the land of Homological Algebra).

85. Special session on "Węzły i związane z nimi struktury algebraiczne; zastosowania w fizyce i biologii" (Knots and related to them algebraic structures; applications in Physics and Biology) at Forum of Polish Mathematicians, Lublin Poland, 18-22 September 2017.
Jak znaleźć torsje w homologiach Khovanova węzłów? (How to find torsion in Khovanov homology of knots).

86. AMS meeting September 9-10, 2017 (Saturday - Sunday) University of North Texas, Denton, TX Special Session on "Invariants of Links and 3-Manifolds";
Applications of partial presimplicial sets.

87. Series of 3-talks; (Bejing Normal University, China), under the general title:
Knot Theorist adventures in the word of homological algebra (June 26-30, 2017).

88. A series of talks for students in knot theory, consisting of 5 talks on "New homology in knot theory"; Kyungpook National University (KNU, Daegu, Korea) June 19-23, 2017.

   (1) New homology in knot theory I: Khovanov homology for framed links.
   (2) New homology in knot theory II: (Pre)simplicial and (pre)cubic categories; geometric realizations; homology of small categories with coefficients in functors.
   (3) New homology in knot theory III: Associative (e.g. Hochschild) and distributive (e.g. quandle) homology.
   (4) New homology in knot theory IV: Extreme and almost extreme Khovanov homology.
   (5) New homology in knot theory V: Future directions and open problems.

89. A colloquium (talk directed toward graduate students, Kyungpook National University (KNU, Daegu, Korea) June 21, 2017,
Invariants of knots from Fox 3-colorings to Yang-Baxter operators

90. KIAS research Station (Busan, Korea) conference "Self-distributive system and quandle (co)homology theory in algebra and low-dimensional topology" June 12-16 2017;
Journey from distributive to Yang-Baxter homology; torsion and knot invariants.

91. Invited talk at XX High School (of Zbigniew Herbert) Gdansk – Morena, Poland, June 6, 2017, Knot Theory; was Julian Tuwim studying Knot Theory? (in Polish).

92. A series of talks for graduate students in Knot Theory and Geometric Topology, University of Gdansk, Poland, May 24 - June 2, 2017;
Knot Theory and Geometric Topology (4 talks).

93. Knots in Washington XLIV; April 28-30, 2017, George Washington University Washington, DC, USA;
Almost extreme Khovanov homology of semi-adequate diagrams.

94. The special session on "Combinatorial and Algebraic Structures in Knot Theory" at the AMS Spring Western Sectional Meeting Washington State University, Pullman, WA, April 22-23, 2017;
Geometric realization of partial presimplicial sets and the almost extreme Khovanov homology.

95. The special session of AMS on "Inverse Problems" at the AMS Spring Western Sectional Meeting Washington State University, Pullman, WA, April 22-23, 2017;
Does Khovanov homology lead to bouquets of spheres?

96. The Catholic University Seminar in Functional Analysis and related areas, April 12, 2017,
Quantum plane and plucking polynomial of rooted trees and pointed graphs.

97. UMBC Computer Science and Electrical Engineering (CSEE) Seminar Series, April 7, 2017,
Quantum plane and plucking polynomial of rooted trees.

98. Algebraic Topology seminar, March 21, 2017, Mathematics Department, Warsaw University;
Almost extreme Khovanov homology.

99. KMMF Seminar "Theory of Duality", March 16, 2017 10:00am - 11:15am Physics Department, Warsaw University;
Torsion in Khovanov homology.

100. KMMF Seminar "Theory of Duality", March 9, 2017 10:00am - 11:15am Physics Department, Warsaw University;
Introduction to Khovanov homology.

101. Advanced School on Integrability March 6-8, 2017, University of Warsaw,
Series of 3 talks under the general title:
Knot theory from Fox 3-coloring to Yang-Baxter homology.

102. 3rd EMBO Workshop on Computational and Structural Biology, Serock, Poland March 3, 2017;
Topologist reflects on pseudoknots

103. **Colloquium, University of Gdansk, February 16, 2017;**
    Khovanov homology of links.

104. **Invited Talk at Maite Lozano Special Session at Spanish Mathematical Society Meeting in Zaragoza, January 31, 2017;**
    Search for torsion in Khovanov homology.

105. **Knots in Washington XLIII; 60th birthday of J. Scott Carter December 9-11, 2016 George Washington University Washington, DC, USA;**
    In the steps of Scott: studying distributive homology.

106. **Topology Seminar, North Carolina State University (Raleigh), November 21, 2016;**
    Homotopy type of circle graphs complexes motivated by extreme Khovanov homology.

107. **Algebra and Combinatorics Seminar, Claremont Colleges, CA, October 25, 2016;**
    Quantum plane, q-polynomial of rooted trees, and rooted graph invariants.

108. **Colloquium, University of Texas at Dallas, October 14, 2016;**
    Plucking polynomial.

109. **Colloquium, George Mason University, September 23, 2016,**
    Playing with homotopy: does Khovanov homology lead to bouquets of spheres?

110. **Logic-Topology seminar at GWU, September 7, 2016;**
    Playing with homotopy: Does Khovanov lead to bouquets of spheres in polynomial time?

111. **Knots in Hellas II conference, Ancient Olympia, Greece, 2016; 17-23 July, 2016;**
    Knot Theory: from Fox 3-colorings of links to Yang-Baxter homology;
    Plenary Talk, July 21, 2016.

112. **Seminar at the University of Barcelona, July 12, 2016, Knot Theory: from Ramon Llull combinatorial machines to Yang-Baxter homology.**

113. **Algebraic Topology Seminar, Warsaw University, July 5, 2016, Does Khovanov homology lead to wedges of spheres? (Czy skrajne homologie Chowanowa prowadza do bukietu sfer?)**
    http://www.mimuw.edu.pl/ aweber/STA/16.07.05.pdf

114. **Topology Seminar; Warsaw, June 3, 2016;**
    Homotopy type of extreme Khovanov homology;
    (In Polish: Typ homotopijny skrajnych homologii Chowanowa)

115. **Topology-Knot Theory Seminar at University of Gdansk, June 1, 2016;**
    Homotopy type of the independence complex of a circle graph: motivation from Khovanov homology of links;
    (in Polish: Typ homotopijny kompleksu niezależności grafu okręgu: motywacja homologiami Khovanova splotów).

116. Special pre-KiTT (Knots in The Triangle) seminar, April 28, 2016, North Carolina State University;
Does Khovanov homology lead to wedges of spheres?
http://at.yorku.ca/cgi-bin/abstract/cbmk-29

117. Special session "on Inverse Problems" at the AMS meeting April 9-10, 2016 (Saturday - Sunday) Spring Western Sectional Meeting University of Utah, Salt Lake City, UT Meeting #1119;
A few problems in knot theory or motivated by knot theory

118. Conference, Advances in Quantum and Low-Dimensional Topology March 11-13, 2016 University of Iowa;
Curtain homology: visualizing the path to Yang-Baxter homology.

119. Seminar of the Department of Algebra - Universidad de Sevilla, Spain, March 4, 2016;
From Fox 3-colorings of knots to homology of Yang-Baxter operators.

120. Topology Seminar, Claremont Colleges, February 16, 2016;
Knot Theory: from Fox 3-colorings to Yang-Baxter homology.

121. Colloquium, Dartmouth College, January 21, 2016;
Knot Theory: from Fox colorings to Yang-Baxter homology.

122. Special session on "Algebraic and Combinatorial Structures in Knot Theory" at the AMS meeting October 24-25, 2015 (Saturday - Sunday) California State University, Fullerton, Fullerton, CA,
Cocycle multipliers of Yang-Baxter operators

123. Special session on "Algebraic and Combinatorial Invariants of Knots" at the AMS meeting October 3-4, 2015 (Saturday - Sunday) Loyola University Chicago, Chicago, IL;
Curtain homology: 2-(co)cycle invariants from Yang-Baxter operators.

124. Logic-Topology seminar at GWU, September 23, 2015;
Curtain homology and logic.

125. Conference: Glances at Manifolds: Knots and Links, Manifolds and Orbifolds, Toric Topology and Group Actions, July 17-20, 2015, Krakow, Poland,
From Fox colorings to Yang-Baxter homology with the Jones polynomial and the Khovanov homology in a background (Introductory plenary talk (90 minutes)).

126. The conference "Quantum Topology" , Euler International Mathematical Institute, St. Petersburg, Russia, July 13-18, 2015;
Homology of Yang-Baxter operators and search for (co)cycle invariants of knots.

127. Algebraic Topology Seminar, Warsaw University, Poland; July 10, 2015;
Homology of Yang-Baxter operators and search for (co)cycle invariants of knots.

128. **Talk at Special Mathematical High School in Gdynia, Poland; June 11, 2015,**
Czy Tuwim studiował teorię węzłów? (in Polish; Was Tuwim studying Knot Theory?)

129. **Odczyt popularny z serii Swiat jest matematyczny (Talk in the series: world is mathematical), University of Gdansk, June 10, 2015;**
Od 3-kolorowania wezlow do operatorow Yanga-Baxtera (in Polish; From Fox 3-colorings to Yang-Baxter operators).

130. **Topology seminar, University of Gdansk, June 3, 2015;**
Nieprzemienna płaszczyzna i q-wielomian drzewa z korzeniem (in Polish; noncommutative plane and q-polynomial of a rooted tree).

131. **Seminarium licencjackie z topologii (undergraduate seminar), University of Gdansk, June 1, 2015;**
Węzły i homologie dystrybutywne (in Polish; Knots and distributive homology).

132. **Series of talks for graduate students (10 double talks) at University of Poznan May 25-29, 2015.**
Adventures of Knot Theorist: From Fox 3-colorings to Yang-Baxter homology with the Jones polynomial and the Khovanov homology in a background (Przygody badacza węzłów: od 3-kolorowania Foxa do homologii operatora Yanga-Baxtera z wielomianem Jonesa i homologiami Khovanova w tle).

133. **Seminar at "Knot homologies, BPS states, and SUSY gauge theories" program at Simons Center for Geometry and Physics at Stony Brook, May 5, 2015;**
Homology of quandles and Yang-Baxter operators.

134. **Seminar at "Knot homologies, BPS states, and SUSY gauge theories" program at Simons Center for Geometry and Physics at Stony Brook, Aril 30, 2015;**
From Fox 3-colorings of knots to homology of Yang-Baxter operators.

135. **Special session "Algebraic Structures in Knot Theory" at the AMS Spring Sectional meeting at UNLV in Las Vegas, NV, April 18-19, 2015;**
Precubic homotopy: knot theory motivated "abstract nonsense".

136. **Special session on "Inverse Problems and Related Mathematical Methods in Physics" at the AMS Spring Sectional meeting at UNLV in Las Vegas, NV, April 18-19, 2015;**
From quantum plane to q-polynomial of rooted trees.

137. **Colloquium, University of South Florida, Tampa, FL, February 10, 2015;**
q-polynomial invariant of rooted trees; state sum invariant of graphs

138. **Knots in Dallas: Conference on Knot Theory and Its Applications to Physics and Quantum Computing, University of Texas at Dallas Richardson TX, January 5-9, 2015;**
Forty years in Mathematics: personal perspective.

139. Seminar in Fuctional Analysis and related areas, Catholic University of America, Washington, DC, October 8, 2014;
A polynomial invariant for plane rooted trees.

140. Special session "Knot Theory" at the DMV-PTM Mathematical Meeting in Poznan, Poland, September 17-20, 2014;
Connecting distributive and Khovanov homology via Yang-Baxter operators.

141. PTM – University of Poznan, Colloquium, September 15, 2014. Simplicial modules, quantum plane, and q-polynomial of rooted trees.

142. Logic-Topology seminar at GWU, September 12, 2014;
Simplicial modules, quantum plane, and q-polynomial of rooted trees.

143. The sixteenth Andrzej Jankowski Memorial Lecture and conference; Mathematical Institute of Gdansk University, Gdansk Branch of the Mathematical Institute, Polish Academy of Sciences, June 13–15, 2014,
q-chain complexes and q-polynomial of rooted trees

144. Topology Seminar, University of Gdansk, June 4, 2014;
Kategorie symplicjalne i kubiczne w teorii wezlow (Polish; Simplicial and Cubic Category in Knot Theory)

145. Oberwolfach Meeting: Algebraic Structures in Low-Dimensional Topology, Oberwolfach, Germany, May 25 - May 31, 2014;
Progress in distributive homology: from q-polynomial of rooted trees to Yang-Baxter homology

146. Knots in Washington XXXVIII: 30 years of the Jones Polynomial, May 9-11, 2014;
A q-polynomial invariant of rooted trees.

147. Colloquium, Texas Tech, Lubbock Texas, April 15, 2014;
From Knots to Homological Algebra of Distributive Structures.

148. AMS special session on Topology and Physics, at AMS Meeting #100, April 11-13, 2014, Lubbock, Texas;
Knot Theory motivated t-simplicial modules.

149. AMS special session on The Inverse Problem and Other Mathematical Methods Applied in Physics and Related Sciences at AMS Western Spring Sectional Meeting #1099, University of New Mexico, Albuquerque, NM April 5-6, 2014 (Saturday - Sunday);
Degenerate homology in frail simplicial modules

150. AMS Special Session on "Knots and Applications" at the AMS meeting March 29-30, 2014 at University of Maryland, Baltimore County, Baltimore, MD;
Progress in Yang-Baxter homology

151. **AMS special session on Computability in Geometry and Topology at Joint Mathematics Meetings Baltimore Convention Center, Hilton Baltimore, and Baltimore Marriott Inner Harbor Hotel, Baltimore, MD January 15-18, 2014 (Wednesday - Saturday);**
Polynomial time complexity from Jones polynomial to Khovanov homology.

152. **The conference at Knot 2013, India, December 16, 2013;**
Yang-Baxter homology: in search for a link between quandle and Khovanov homology of knots

153. **Three lectures in Advanced School (ICTS Program: Knot 2013) (mini-course), India, December 10-15, 2013;**
Lecture 1: Knots and distributive homology I: quandle colorings and weighted colorings
Lecture 2: Knots and distributive homology II: pre-simplicial and pre-cubic sets; geometric realization
Lecture 3: Knots and distributive homology III: (co)cycle invariants in codimension two embeddings

154. **Topology Seminar, Warsaw University Poland, December 6, 2013;**
"Czy homologie dystrybutywne, poprzez rownanie Yanga-Baxtera, prowadza do homologii Khovanova splotow?" (Are distributive homology, via Yang-Baxter equation, leading to Khovanov homology?)

155. **Geometry-Topology seminar, University of Maryland (College Park), November 25, 2013,**
Homology of Yang-Baxter operators and knot theory.

156. **2013 LLoyd Roeling UL Lafayette Mathematical Conference on Topology, November 8-10, 2013 (Plenary talk);**
Cocycle invariants of codimension 2-embeddings of manifolds

157. **Colloquium, November 2013, University of Louisiana at Lafayette;**
Knot Theory and Yang-Baxter operators

158. **AMS special session on Algebraic Structures in Knot Theory at the AMS' Western Fall Sectional Meeting at the University of California at Riverside, November 2-3, 2013,**
Homology of Yang-Baxter operators

159. **AMS special session on Algebraic and Combinatorial Invariants of Knots at the 2013 Fall Central Sectional Meeting (Meeting #1094) October 18-20, (Friday and Sunday) at Washington University (St Louis, MO),**
Cycle invariants of codimension 2-embeddings $f : M^n \to R^{n+2}$

160. **Conference: 5. Forum Matematykw Polskich, Rzeszow, Poland, 16-20 September, 2013;**
"Wezly i homologie dystrybutywne" (Knots and distributive homology)

161. Conference: Knots, Manifolds and Group Actions, September 11-14, 2013, Slubice, Poland;
Knots and distributive homology.

162. Logic-Topology Seminar, GWU, September 5, 2013;
Quandles and codimension two embeddings.

163. VII Północne Spotkania Geometryczne (conference); Maria Curie-Sklodowska University, Lublin, June 22-23, 2013;
Associative and Distributive Homology (in Polish).

164. The Fifteenth Andrzej Jankowski Memorial Lecture and conference; Mathematical Institute of Gdansk University, Gdansk Branch of the Mathematical Institute, Polish Academy of Sciences, May 24-25, 2013,
Knots and distributive homology

165. AMS special session on Themes in applied mathematics: from data analysis through fluid flows and biology to topology at the 2013 Spring Western Section Meeting at University of Colorado at Boulder, CO, April 13-14, 2013,
Degenerate part of a rack homology satisfies Künneth formula, I: weak simplicial modules

166. Algebraic Topology Seminar; Warsaw University, Poland, Jan. 25, 2013,
Inaugural Presidential Professor's Talk,
Degenerate part of distributive homology (in Polish).

167. Topology Seminar; University of Louisiana, at Lafayette, November 9, 2012;
Bicomplex from degenerate elements of a weak simplicial module.

168. AMS special session on Combinatorial Methods in Knot Theory at Fall Section AMS Meeting at Tulane University, New Orleans, October 13-14, 2012; Extending an entropic magma by an affine entropic magma

169. Geometry-Topology Seminar at University of Pennsylvania, Oct. 4, 2012;
Algebraic structures and their homology.

170. Logic-Topology Seminar at GWU, Monday, September 10, 2012;
An Introduction to Entropic Homology.

171. 2012 TAPU Workshop on Knot Theory and related topics; 23 July -27 July 2012, Pusan National University, Busan, South Korea (supported by National Institute for Mathematical Sciences(NIMS));
Plenary talk, and a follow up series of talks at TAPU Summer Summer School on Quandle Theory:
(I.) Knots and distributive homology I: overview;
(II.) Knots and distributive homology II.
(III.) Knots and distributive homology III.
(IV.) Knots and distributive homology IV.

172. Mini-symposium and special session STS "Knot Theory and its ramifications" at The 6th European Congress of Mathematics Krakow, Poland, July 2-7, 2012. Distributivity versus associativity in the homology theory of algebraic structures.

173. Workshop on low dimensional conformal structures and their groups Gdansk, Poland, 27-29 June 2012;
Quandle of Dehn twists and symplectic quandle.

174. Twelve Gdansk lectures: Topics in Algebraic Topology, Gdansk, May-June 2012;

175. Talk at Special Mathematical High School in Gdynia, Poland; June 19, 2012. Matematyczne metody badania wezlow: od kolorowania Foxa do otwartych problemow (in Polish; Mathematical methods in knot theory: from Fox coloring to open problems.

176. The Fourteenth Andrzej Jankowski Memorial Lecture and conference; Mathematical Institute of Gdansk University, Gdansk Branch of the Mathematical Institute, Polish Academy of Sciences, June 16, 2012,
Homology of distributive structures and its knot theory applications.

177. Oberwolfach Meeting: Invariants in Low-Dimensional Topology and Knot Theory, Oberwolfach, Germany, June 3 - June 9, 2012;
Homology of distributive structures and its knot theory applications;

178. Lomonosov Moscow State University, Russia; topology mini-course:
(i) From knot theory to associative and distributive homology. I (May 29, 2012);
(ii) From knot theory to associative and distributive homology. II (May 30, 2012);
(iii) From knot theory to associative and distributive homology. III (June 1, 2012);

179. Alexandroff Readings International Topological Conference; Moscow (Russia), May 21-25, 2012;
Distributivity versus associativity; homology theory applied to knot theory (May 23).

180. AMS special session on Invariants of Knots at the Spring Central Meeting (Meeting #1081) March 30 - April 1, (Friday - Sunday) at Kansas University (Lawrence, Kansas);
Torsion in one term distributive homology

181. AMS Special Session on "Mathematics Applied in the Sciences: From Statistics to Topology" at AMS Sectional Meeting #1080; Washington DC, March 17-18, 2012;
Kauffman bracket skein module of a thickened surface and virtual knots.

182. Knots in Washington XXXIV; Categorification of Knots, Quantum Invariants and Quantum Computing, March 14-16,i 2012;
Distributive homology: progress in the last two years.

183. AMS Special Session on Algebraic and Combinatorial Structures in Knot Theory; March 10-11, 2012 (Saturday - Sunday) University of South Florida, Tampa, FL (2012 Spring Southeastern Section Meeting) Meeting # 1079;
Conway algebras, Tutte algebras, and invariants of links.

184. BIRS workshop on Ordered groups and topology, Banff, Canada February 12-17, 2012
Orderings on Conway algebras, and Tutte algebras; is anything known?

185. Colloquium at University of Illinois at Chicago; January 27, 2012;
Distributivity versus Associativity in Homology Theories.

186. Quantum topology seminar, University of Illinois at Chicago, January 26, 2012;
Conway algebras and invariants of classical and virtual links.

187. Colloquium at University of Louisiana, at Lafayette, November 8, 2011;
Homology of semi-lattices and distributive lattices.

188. AMS Special Session on Category Theory in Graphs, Geometry and Inverse Problems; 2011 Fall Western Section Meeting University of Utah, Salt Lake City, UT October 22-23, 2011 (Saturday - Sunday) Meeting #1075;
Homology of distributive lattices: splitting chain complexes.

189. Logic and Topology seminar, GWU, September 20, 2011;
Homology of distributive lattices.

190. Warsaw Technical University ; Seminar; Warszawa, June 28, 2011;
Homologie struktur rozdzielczych (Homology of distributive structures).

191. Thirteen Gdansk lectures in Knot Theory and related with knots algebraic structures; Gdansk, May-June 2011 (see the book based on these talks).

192. University of Gdansk; Seminar; June 1, 2011
Polgrupa dzialan dwuargumentowych i porownanie homologii bazujacych na rozdzielczosci z klasycznymi homologiami (Semigroup of 2-argument operations and comparision between homology based on distributivity and classical homology).

193. Swiss Knots 2011; the Conference on Knot Theory and Algebra, Lake Thun, Switzerland, May 23-27, 2011; Plenary Talk;
Homology of distributive structures: monoid of binary operations and examples of computation.

194. Topology seminar, Warsaw University, May 10, 2011, Homologie rozdzielczych struktur (Homology of distributive structures).

195. **Knots in Washington XXXII; Categorification of Knots, Algebras, and Quandles; Quantum Computing; April 30, 2011;**
Weak and very weak simplicial modules: application to homology of distributive structures.

196. **Geometry-Topology seminar, University of Maryland (College Park), April 25, 2011;**
Homology of distributive structures.

197. **Topoloy seminar, SUNY at Buffalo, April 15, 2011;**
Homology of distributive magmas.

198. **International Workshop on Applied Category Theory and Graph-Operad-Logic; San Antonio, Texas, March 14-19, 2011;**
The series of talks: Homology of distributive Structures: from Boolean algebras to spectral sequences. (1) Homology of distributive structures 1: distributivity versus associativity; (2) Homology of distributive structures 2: semigroup of binary operations; (3) Homology of distributive structures 3: one term distributive homology (4) Homology of distributive structures 4: rack homology and quandle homology; homology of a dihedral quandle as a case study. (5) Homology of distributive structures 5: Homology of boolean algebras

199. **International Workshop on Category Theory and Graph-Operad-Logic; San Antonio, Texas, March 18, 2011**
Homology of a small category with coefficient in R-Mod functor: the case of a Khovanov type functor determined by a link diagram.

200. **AMS Special Session on Algebraic modeling of knotted objects, at the first joint meeting of the AMS and the Sociedad de Matematica de Chile, Pucon, Chile, December 15-18, 2010;**
Quandle operation groups and associated homology

201. **Conferencia (seminar), Universidad de Valparaiso, Chile, December 13, 2010;**
Computing one term distributive homology.

202. **Knots in Washington XXXI; Categorification, Quandles, Quantum knots and Quantum computing; December 3-5, 2010;**
Homology theory in which distributivity replaces associativity.

203. **Combinatorics, Algebra and Geometry Seminar, George Mason University, November 19, 2010;**
Homology of distributive systems: a historical perspective.

204. **Colloquium, University of Louisiana at Lafayette, Thursday October 28, 2010;**
Homology of distributive structures.

205. **Topology seminar, Columbia University, October 22, 2010;**
Homology of distributive structures

206. **Logic and Topology seminar, GWU, October 20, 2010;**
Homology of distributive structures: from Boolean algebras to spectral sequences.

207. **AMS Special Session on Algebraic Structures in Knot Theory, 2010 Fall Western Section Meeting Los Angeles, CA, October 9-10, 2010;**
The second quandle homology of the Takasaki quandle of even abelian groups.

208. **Knots in Chicago; a conference on Knot Theory and Its Ramifications; September 10-12, 2010; Plenary Talk:**
Homology of racks and quandles: linearization of nonassociative structures.

209. **Knots in Poland III; conference on Knot Theory and its Ramifications; July 18 -24, 2010, Warsaw, July 25- August 4, 2010, Bedlewo:**
(i) Knot Theory: from Listing to Mrowka;
(ii) Introduction to quandles, racks, keis, and their homology.

210. **AMS Special Session on "Homology theories for knots and skein modules" at 2010 Spring Eastern Sectional Meeting May 22-23, 2010 (Saturday - Sunday) New Jersey Institute of Technology, Newark;**
The second quandle homology of the Takasaki quandle of an odd abelian group is an exterior square of the group.

211. **Knots in Washington XXX; Categorification, Quantum knots and Quantum computing; May 19-21, 2010;**
The second quandle homology of the Takasaki quandle of an odd order abelian group.

212. **Topology seminar, University of Tennessee at Knoxville, May 7, 2010;**
Knot Theory from the seal of Lerna to Quandles and their homology.

213. **Topology Seminar, University of Texas at Austin, April 30, 2010;**
Quandles and their homology: nonassociative example in Algebra Situs.

214. **University of Texas at Dallas Seminar, April 20, 2010;**
Homology of Quandles.

215. **AMS Special Session on Subjects in between Pure and Applied Mathematics, at University of New Mexico, Albuquerque, NM (2010 Spring Western Section Meeting) April 17-18, 2010;**
Quandles and their Homology.

216. **Colloquium – Frank Stones Research Lecturship, Texas Christian University, April 13, 2010;**
Stroll through Knot Theory: from diagrams and Reidemeister moves to Quandles and their homology.

217. **AMS Special Session on Quantum Invariants of 3-manifolds and Modular Categories at 2010 Spring Central Section Meeting St. Paul, MN, April 10-11, 2010;**
The second quandle homology of odd Takasaki quandles and exterior algebra

218. **Topology Seminar, Gdansk University, Poland, December 18, 2009;**
     Homologie quandli: graf obliczen i operacje homologiczne (Homology of quandles, graph of computations and homological operations).

219. **Colloquium, Gdansk University, Poland, December 17, 2009;**
     Quandle- historyczne wprowadzenie i teoria ich homologii (Quandles – historical introduction and their homology theory).

220. **Knots in Washington XXIX, 30 years of Quandles, 10 years of Khovanov homology, December 5, 2009;**
     The second quandle homology of Takasaki keis (quandles).

221. **Colloquium, U.S. Naval Academy Annapolis, November 18, 2009;**
     Homology of quandles: a toy or a powerful machinery?

222. **Algebra and Topology Conference at University of Louisiana at Lafayette, November 1, 2009 (Plenary talk);**
     Skein modules of 3-manifolds: from first homology to Khovanov homology.

223. **AMS Special Session on Invariants of Knots and Links at the AMS meeting, Florida Atlantic University, Boca Raton, FL (2009 Fall Southeastern Meeting) October 30 – November 1, 2009;**
     Homology of Takasaki quandles.

224. **Colloquium at University of Texas at Dallas; October 23, 2009;**
     Classical roots and modern fruits of Knot Theory: from Gordian knot to Khovanov homology.

225. **International Centre for Theoretical Physics, Trieste, Italy:**
     Plenary talk at the Conference on Knot Theory and its Applications to Physics and Biology; (May 27, 2009)
     Skein module motivation for Gram determinants of curves on surfaces.

226. **International Centre for Theoretical Physics, Trieste, Italy:**
     Series of 3 lectures at Advanced School and Conference on Knot Theory and its Applications to Physics and Biology:
     Fox coloring, Burnside groups, skein modules and Khovanov categorification of skein modules; I (May 11, 2009);
     Fox coloring, Burnside groups, skein modules and Khovanov categorification of skein modules; II (May 12, 2009);
     Fox coloring, Burnside groups, skein modules and Khovanov categorification of skein modules; III (May 13, 2009);

227. **Topology seminar, University of Virginia, April, 30, 2009;**
     Algebra Situs: panorama of skein modules.

228. Lecture at Polish Professors Club, March 6, 2009, Kensington, MD;
Klasyczne źródła teorii węzłów (in Polish; Classical roots of Knot Theory)

229. Knots in Washington XXVIII, February 27 – March 1, 2009;
Domination of knots and the Jones polynomial.

230. AMS Special Session on Categorification and Link Homology at the AMS 2009 National Meeting, Washington D.C., January 5-8, 2009;
Gram determinants of planar states and Lagrangian tangles.

231. The Workshop "The Mathematics of Knots: Theory and Application" Heidelberg, Germany, December 15-19, 2008; Plenary talk
Skein module motivation for Gram determinants of planar curves

232. The International Conference "Geometry and Topology in Low Dimensions", CIRM in Luminy, France, November 17 -21, 2008,
Gram determinants of planar curves: Skein Module motivation

233. Colloquium, Howard University, November 7, 2008;
Gram determinants of planar curves: topological motivation

234. Topology seminar, Louisiana University, Lafayette, October 2008;
Gram determinants in Knot Theory: skein module motivation

235. Topology seminar, Technical University in Athens, Greece, June 20, 2008
An introduction to Khovanov homology via Kauffman bracket polynomial of knots.

236. Conference on Algebraic and Geometric Topology June 09-13, 2008, Gdansk, Poland,
Solution to Rodica Simion question on the Gram determinant of the type B Temperley-Lieb algebra.

237. Topology Seminar, Bard College, NY, April 28, 2008
Quandles in Knot Theory; how to approach Nakanishi 4-move conjecture.

238. AMS Special Session on Knot and 3-Manifold Invariants at the 2008 Spring Southeastern Meeting Baton Rouge, LA, March 28-30;
The Gram determinant of the type B Temperley-Lieb algebra and the determinant of the matrix of chromatic joins

239. Knots in Washington XXV; Dedicated to Herbert Seifert on his 100 birthday, December 7-9, 2007;
Torsion in $H_{A_2}^{2,v(G)-2}(G)$ and its applications to Khovanov homology of adequate diagrams.

240. Knotting Mathematics and Art: Conference in Low Dimensional Topology and Mathematical Art Nov. 1-4, 2007, at University of South Florida, Tampa, FL,
History of knot theory: art and science.

241. **AMS Special Session on Topics in Mathematical Physics at the AMS meeting, Albuquerque, NM, October 13-14, 2007;**
Hochschild homology of Frobenius algebras via link diagrams; Khovanov homology

242. **AMS Special Session on Invariants of links and 3-manifolds at the AMS/PTM International Meeting, July 31 - August 3, 2007, Warsaw, Poland;**
Hochschild homology of Frobenius algebras via link diagrams

243. **Nagoya (NIT) topology seminar, June 30, 2007,**
Introduction to Khovanov homology via Hochschild homology and Taits graphs of links

244. **Waseda University seminar, Tokyo, Japan, June 15, 2007;**
Introduction to Hochschild and Khovanov homologies

245. **Seminar, International Centre for Theoretical Physics, Trieste, Italy, May 15, 2007;**
Definition of Khovanov homology from Kauffman bracket

246. **Seminar, International Centre for Theoretical Physics, Trieste, Italy, May 9, 2007;**
Introduction to Khovanov homology of knots via Hochschild homology of algebras

247. **BIRS workshop "The many strands of the braid groups", Banff, Canada, April 22 − 27, 2007;**
2-braid intersection of Hochschild and Khovanov homologies

248. **Knots in Washington XXIV; Dedicated to the memory of Xiao-Song Lin, April 13-15, 2007;**
Burnside groups of knots, tangle moves and their skein module deformations

249. **AMS Special Session at Oxford, OH, March 15-18, 2007;**
Homology of dihedral quandles

250. **Algebraic topology seminar, Warsaw, Poland, February 27, 2007,**
Jak zbudowac homologie grafow bazujace na nieprzemiennych algebrach (How to build homology of graphs with underlying noncommutative algebras)

251. **Polish Mathematical Society seminar, Gdansk, Poland, February 23, 2007,**
Introduction to Khovanov homology (in Polish)

252. **Algebraic topology seminar, Warsaw, Poland, February 20, 2007,**
Od homologii Hochschilda algebr do homologii Khovanova splotow (From Hochschild homology of algebras to Khovanov homology of links)

253. **AMS Special Session on Knots, 3-manifolds, and Their Invariants at the National AMS Meeting in New Orleans, January 5-8, 2007,**
Hochschild homology, cones, and combinatorial patterns in Khovanov type graph homology

254. **Workshop: Knots and Braids, Banach Center, Warsaw, Poland Dec. 11-17, 2006;**
     From Reidemeister moves to Quandle homology

255. **Topology student seminar, Gdańsk University, December 8, 2006;**
     Od 3-kolorowania Foxa do Quandli II (From Fox 3-coloring to Quandles II).

256. **Colloquium, Gdańsk University, December 7, 2006;**
     Dwie drogi do homologii Khovanova: przez wielomian Jonesa i przez homologie
     Hochschilda (Two paths to Khovanov homology: through Jones polynomial and
     through Hochschild homology).

257. **Geometry and Topology seminar, Gdańsk University, December 6, 2006;**
     Homologie Dihedralnych Quandli (Homology of Dihedral Quandles)

258. **Topology student seminar, Gdańsk University, December 1, 2006;**
     Od 3-kolorowania Foxa do Quandli: I (from Fox 3-coloring to Quandles: I).

259. **Knots in Washington XXIII; Quandles, their homology and ramifications, November, 2007**
     Homology of dihedral quandles II

260. **Conference on Categorification in Algebra and Topology, September 7-10, 2006,**
     Uppsala, Sweden;
     Hochschild homology as Khovanov homology of torus links

261. **Geometry and Topology of Low Dimensional Manifolds, A conference in honour of**
     Prof. Maria Teresa Lozano, Prof. José Maria Montesinos, Prof. David Singerman,
     31 August − 2 September 2006, El Burgo de Osma, Spain, Plenary talk,
     Khovanov homology of links and Hochschild homology of algebras
     http://www.mai.liu.se/LowDim/abstract.html#Przytycki

262. **Knots in Washington XXII, May 5-7, 2006,**
     Combinatorial patterns in Khovanov type graph homology motivated by Hochschild
     homology

263. **AMS Special Session on Quantum invariants of knots and 3-manifolds, Durham,**
     NH, April 22-23, 2006,
     Combinatorial patterns in Khovanov type graph homology

264. **Geometric Topology seminar, Columbia University, March 24, 2006,**
     Hochschild homology and combinatorial patterns in Khovanov type graph homology.

265. **AMS Special Session on Quantum Invariants of knots and 3-manifolds, San Antonio, TX, January 12-15, 2006.**
     Confluence of Khovanov homology and Hochschild homology.

266. Knots in Washington XXI: Skein modules, Khovanov homology and Hochschild homology, GWU, December 9-11, 2005.
Confluence of Khovanov homology and Hochschild homology: Application to truncated polynomial algebra.

267. Colloquium, Boise State University; November 4, 2005,
From Khovanov homology to Hochschild homology and back in 50 minutes.

268. AMS Special Session on Invariants of Graphs and Matroids, October 8-9, 2005, Bard College, Annandale-on-Hudson;
Khovanov graph homology as a Hochschild homology of graphs.

269. AMS Special Session on Invariants of Graphs and Matroids, October 8-9, 2005, Bard College, Annandale-on-Hudson;
Introduction to Khovanov homology and graph homology (with M. Pabiniak and R. Sazdanovic).

270. Colloquium, George Mason University, September 30, 2005,
Open problems in Knot Theory which everyone can try to solve,

271. Workshop on Khovanov Homology and Hochschild homology, Univ. Iowa, September 15-21, 2005,
Khovanov Homology and Hochschild homology (plenary talk)

272. Topology seminar, U. Iowa, Sept. 20, 2005,
Introduction to Khovanov homology and Hochschild homology,

273. MANIFOLDS and their MAPPINGS - 5th International Siegen Topology Symposium
Monday, July 25, - Saturday, July 30, 2005;
Relation between Khovanov homology and cyclic homology of Connes,

274. AMS-IMS-SIAM Summer Research Conferences in the Mathematical Sciences, "Quantum topology — contemporary issues and perspectives", the Snowbird Resort, Snowbird, Utah, June 4 - June 10, 2005, Two talks:
(i) Panorama of skein modules,
(ii) From Kauffman bracket to Khovanov homology and Connes cyclic homology

275. Colloquium, University of South Florida, Tampa, FL, April 1, 2005 Old problems – new solutions in Knot Theory.

276. Georgetown colloquium, Monday, March 21, 2005;
Open problems in Knot Theory which everyone can try to solve.

277. Conference on Braids, Links, and Mapping Class Groups (Joan Birman's retirement conference); March 17-20, 2005; Plenary talk;
Skein module deformation of rational moves: Invariants motivated by a braid group action on Takasaki's Kei.

278. Colloquium, Dartmouth College, March 3, 2005,
Open problems in Knot Theory which everyone can try to solve.

279. Geometry seminar, Dartmouth College, March 3, 2005,
Khovanov type homology for twisted I-bundles over surfaces

280. Port City Topology Conference, Mobile, Alabama, February 26-27, 2005;
Kei, Burnside groups and skein module deformation of rational moves

281. Knots in Washington XX: 60th birthday of Louis H. Kauffman, GWU, February 11-13, 2005.
Survey on the Kauffman bracket skein modules of 3-manifolds

282. Topology seminar, Waseda University, Tokyo, January 27, 2005;
Kei, Burnside groups, Fox colorings and tangle moves.

283. Topology Seminar, RIMS, Kyoto University, January 24, 2005;
Fox colorings, Burnside groups and Kei as obstructions to rational moves.

284. Tsuda College, Tokyo, January 20, 2005;
Rational moves: seven elementary open problems.

285. Tokyo Institute of Technology, January 19, 2005,
Categorification of Kauffman skein relation: Khovanov homology and skein modules.

286. Workshop "Topology of Knots VII", TWCU, Japan, Dec. 23, 2004.
Obstructions to tangle embeddings modulo rational moves

287. Topology seminar, University of Tokyo, Dec. 21, 2004
Khovanov Homology: categorification of the Kauffman bracket relation

288. Topology seminar, Nippon University, Japan Dec. 18, 2004,
Constructing fundamental groups of branched coverings – detecting non-orderability.

289. Williams College, Nov 19, 2004,
Seven elementary open problems in Knot Theory.

290. Knots in Washington XIX: Topology in Biology 2, Georgetown University and GWU, November 12-14, 2004,
An introduction to Khovanov homology categorification of skein modules.

291. AMS Special Session on Braids and Knots, October 16-17, 2004, Albuquerque, New Mexico,
Kauffman-Harary Conjecture for Montesinos links and closed 3-braids

292. AMS Special Session Categories and Operads in Topology, Geometry, Physics and Other Applications, October 16-17, 2004, Albuquerque, New Mexico,
Categorification of the Kauffman bracket skein module of $F \times I$

293. **Topology Seminar, University of Uppsala, Sweden, September 28, 2004;**
Survey of skein modules of 3-manifolds.

294. **Knots in Vancouver July 18-23, 2004,**
Khovanov Categorification of the Kauffman bracket skein module.

295. **MSRI-PIMS Summer Graduate Programme: Knots and 3-manifolds. Series of 3 talks (Vancouver July 2004).**
1. (July 15) Skein modules and Khovanov Homology 1: Rational moves and Burnside groups and skein module deformations.
2. (July 16) Skein modules and Khovanov Homology 2: Survey of skein modules.
3. (July 17) Skein modules and Khovanov Homology 3: Khovanov homology as a categorification of the Kauffman bracket.

296. **Knots in Washington XVIII, GWU, May 28-30, 2004,**
Thickness of Khovanov homology of k-almost alternating links.

297. **Mathematical circles, Mobile Alabama, March 29, 2004;**
Why knot?

298. **Columbian Fellow lecture, March 24, 2004;**
Classical roots of Knot Theory

299. **Colloquium, University of Texas at Dallas, March 5, 2004;**
How Burnside groups have found their place in Knot Theory

300. **The third International Workshop: Graphs – Operads – Logic, Oaxtepec, Cuautitlan, Mexico, February 4-13, 2004 (three plenary talks);**
1. 10 elementary knotted problems.
2. Fox colorings and their noncommutative generalizations.
3. Lagrangian tangles and imprisoned colors.

301. **AMS Special Session on Low-Dimensional Topology, Phoenix, AZ, January 7-10, 2004; #993,**
Khovanov homology of links in I-bundles over surfaces

302. **Knots in Washington XVII, GWU, December 19-21, 2003;**
My first and hundredth papers: surfaces and periodicity.

303. **Borders in 3-Dim Topology, December 5–7, 2003 The Ohio State University, Columbus, OH**
Skein modules and stratified Khovanov homology.

304. **Workshop on the interaction of finite type and Gromov-Witten invariants Dates: Nov 15-20, 2003, Banff International Research Station). Khovanov homology of tangles and I-bundles over surfaces.**

305. **Mini-Workshop at Oberwolfach – Quantum Topology in Dimension Three, Germany, October 19-25, 2003,**
Khovanov homology of links in I-bundles over surfaces.

306. **Colloquium, University of Iowa, October 2, 2003,**
Old problems – new solutions in the Knot Theory

307. **Topology seminar, University of Iowa, September 30, 2003,**
Skein module motivation for Khovanov homology

308. **Knots in Poland, July 2003, Banach Center (Warsaw and Bedlewo).**
1. 3-moves, 4-moves and rational moves on links, obstructions and conjectures.
2. Introduction to Skein Modules.

309. **Conference–workshop June 2-6, 2003, at SUNY Potsdam).**
Talk 1: Unexpected connections between Burnside groups and Knot Theory.
Talk 2: Skein module deformations of rational moves: landscape of skein modules.

310. **Knots in Washington XVI; May 5-7, 2003, University of Maryland, College Park,**
Kauffman-Harary Conjecture holds for Montesinos knots.

311. **AMS Special Session in Low dimensional topology at the Courant Institute, NY April 12-13, 2003**
Derived group of a link group: three applications.

312. **The geometric topology session of the 2003 Spring Topology and Dynamical Systems Conference. March 20- 22, 2003 at Texas Tech University in Lubbock, Texas.**
Unexpected connection between Burnside groups and Knot Theory.

313. **AMS Special Session on Low Dimensional Topology, Baton Rouge, Louisiana, March 14-16, 2003**
Variety of groups of knots.

314. **The JAMI (Japan-U.S. Mathematics Institute) Spring Conference, JHU, Baltimore, 6 - 16 March 2003,**
Ideal obstructions to embedding tangles into links.

315. **Colloquium, University of Virginia, February 13, 2003**
Unexpected connections between Burnside groups and Knot Theory.

316. **Topology seminar, University of Virginia, February 13, 2003**
Rotors in Graph Theory and Knot Theory.

317. **Topology seminar, JHU, February 10, 2003,**
Unexpected connections between Burnside groups and Knot Theory: solution to Nakanishi conjectures.

318. **AMS special session on Primes and Knots (#983) Baltimore, January 15-18, 2003.**
Number theoretical criterion for invariance of Fox p-colorings under n-rotation.

319. Knots in Washington XV, Japan - USA workshop in Knot Theory II, January 10-15, 2003,
Action of braid groups related to double branched covers.

320. Conference in Low Dimensional Topology to celebrate the sixtieth birthday of Francisco Javier "Fico" Gonzalez Acuna December 9-13, 2002, Universidad Autonoma de Yucatan, Merida, Mexico.
How Burnside groups have found their place in Knot Theory.
Invited plenary talk.

321. Topology seminar, SUNY at Buffalo, November 15, 2002,
Burnside obstructions to Rational moves on links.

322. Colloquium, SUNY at Buffalo, November 14, 2002,
Unexpected connections between Burnside groups and Knot Theory.

323. AMS Special Session on Invariants of Knots and Low-Dimensional Manifolds, Orlando, FL, November 9-10, 2002, Meeting #982
4-moves and 4th Burnside group of links: Nakanishi and Kawauchi conjectures.

324. Conference/workshop July 8-12, 2002, at SUNY Potsdam. Georgia Benkart, Louis Kauffman, and Kazem Mahdavi (organizers). Plenary speaker.
Solution to the Montesinos-Nakanishi 3-move conjecture.

325. Topology Seminar, TWCU, Tokyo, Japan, July 1, 2002;
3-moves, Burnside groups and cubic skein modules.

326. Topology Seminar, Waseda University, Tokyo, Japan; July 5 (Friday) 2002.
Fox 3-colorings and Burnside groups in Knot Theory.

327. Invited plenary speaker,
Topology in Matsue (June 24-28, 2002) International Conference on Topology and its Applications Joined with Second Japan-Mexico Topology Symposium (Shimane University and the Mathematical Society of Japan);
Burnside obstruction to the Montesinos-Nakanishi 3-move conjecture.

328. AMS Special Session on Quantum Topology, Portland, Oregon, June 20-22, 2002.
Rational moves on links measured by Burnside type groups.

329. Poznań University topology seminar, June 4, 2002. Lagranzanowskie suply i przeszkody Burnside w teorii wezlów.

330. Gdańsk topology seminars May 27-28, 2002 (2 invited talks): 1. W Poszukiwaniu nietrywialnego węzła z trywialnym wielomianem Jonesa.
2. Czy ten supeł jest częścią Twojego splotu?

331. Gdansk topology conference (Jankowski memorial) May 24-25, 2002;
Solution to the Montesinos-Nakanishi 3-move conjecture.

332. **Knots in Washington, XIV, Conference on Knot Theory and its Ramifications,** **May 17, 2002, at the George Washington University;**

333. **II Workshop 'GRAPHS-OPERADS-LOGICS', Cuautitlán, México, May 5-12, 2002** **(Invited for series of four talks).**

    1. **How much of the coloring can be caged in a tangle?**

    2. **Skein algebra of a product of a surface and the interval**

    3. **Knotting of ideas from algebra geometry and topology**

    4. **From combinatorics of knot diagrams to the algebraic topology based on knots**

334. **Colloquium, Ohio State University, Columbus Ohio, May 2, 2002,** **Old conjecture – new solutions in the Knot Theory**

335. **Knots in Montreal – hyperbolic volume conjecture (conference) April 19-21, 2002,** **UQAM, Montreal, Canada.** **The Montesinos-Nakanishi 3-move conjecture is solved.**

336. **Topology seminars, April 1, 8, 2002, University of Maryland.** **1. Burnside obstructions to the Montesinos-Nakanishi 3-move conjecture.** **2. Lagrangians of tangles and rotors of links.**

337. **Workshop on Quantum Topology, March 18-22, 2002 in Warwick,** **Quantum obstructions to tangle embeddings.**

338. **AMS Special Session on Quantum Topology in Dimension Three; Ann Arbor,** **Michigan, March 1-3, 2002** **Presentations od Skein Algebras.**

339. **AMS special session on Computational Topology San Diego, California, January** **8, 2002;** **Polynomial time complexity algorithm for computing coefficients of the Jones-** **Conway (Homflypt) and Kauffman polynomials of links.**

340. **Knots in Washington, XIII, Conference on Knot Theory and its Ramifications,** **Dec. 16, 2001, at the George Washington University;** **Rotors and the homology of branched double covers of links and tangles.**

341. **AMS Special Session on Quantum Topology, Columbus at OSU; September 21-23,** **2001;** **Lagrangian approximation of Fox p-colorings of tangles; Fox approximation of ra-** **tional $\frac{p}{q}$-moves.**

342. **Research Institute for Mathematical Sciences (RIMS), Kyoto University; workshop** **on invariants of knots and 3-manifolds** **1. Seminar talk; RIMS, September 11, 2001;**

Skein modules with a cubic skein relation: properties and speculations.
2. Workshop talk, RIMS, September 18, 2001;
Symplectic structure on colorings, Lagrangian tangles and its applications.

343. "New Techniques in Topological Quantum Field Theory" Workshop; Calgary, Canada, August 2001;
Symplectic structure on colorings of tangles

344. Knots in Washington, XII, Conference on Knot Theory and its Ramifications, May 10-12, 2001, at the George Washington University;
Lagrangian approximation of local moves on links.

345. AMS Special Session on Topology of links at the AMS meeting at UNLV, Las Vegas, April 21-22, 2001,
Symplectic form on t-colorings of tangles.

346. Knots in Montreal (conference) April 7-8, 2001, UQAM, Montreal, Canada.
Lagrangian tangles in Fox coloring spaces and their t-deformations.

347. The First International Workshop on Graphs – Operads – Logic, Cuautitlán, México, March 12-16, 2001.
Three talks under the general title Algebraic Topology Based on Knots.

   (1) Open problems in knot theory that everyone can try to solve.

   (2) Lagrangian approximation of Fox p-colorings of tangles.

   (3) Historical Introduction to Skein Modules.

348. KNOTS, LINKS and MANIFOLDS - 4th International Siegen Topology Symposium - January 4–8, 2001, Siegen Germany
Symplectic form on colorings of tangles: the structure theorem and applications.

349. Warsaw University Topology seminar; December 12, 2000,
Przestrzeń symplektyczna kolorowań n-supła.

350. AMS Special Session on The topology of 3-manifolds Columbia University, NY, November 2000,
Symplectic structure on colorings of tangles

351. AMS Special Session on Diagrammatic Morphisms in Algebra, Category Theory, and Topology, San Francisco State University on October 21-22, 2000.
Symplectic structure on Colorings and Lagrangian tangles.

352. Topology seminar(s), Gdansk University, Poland, May 12-13, 2000, Two (not so easy) talks on Algebra Situs.

353. Colloquium, Polish Mathematical Society and Banach Center, Warsaw, Poland; May 11, 2000 Skein modules of 3-manifolds: from quantized homology to the Kontsevich Theorem on Vassiliev invariants.

354. Colloquium, Lviv University, Ukraine, May 7, 2000;
Algebraichna topologia shcho bazuetsa na vuzlach (Algebraic topology based on knots).

355. AMS Special Session on Quantum Topology April 14-16 2000; Lafayette, Louisiana.
Are the Reshetikhin-Turaev-Witten invariants determining the volume of a hyperbolic 3-manifold?

356. 5. Topology seminar(s), Gdansk University, Poland, March 31 - April 1, 2000
Three easy talks on knot theory and skein modules.

357. 6. Knot Theory Seminar, Banach Center, Warsaw, Poland; March, 22, 2000; Hopf algebra structure of Vassiliev-Gusarov skein modules of Knots and Links.

358. Colloquium, Gdansk University, Poland, March 6, 2000
Skein moduły: Od 3-kolorowania do Twierdzenia Koncewicza o niezmiennikach Wasiliewa, in Polish (Skein modules: from the 3-coloring to the Kontsevich Theorem on Vassiliev invariants)

359. Colloquium, Case Western Reserve University, February 25, 2000; Algebra Situs − how to build an algebraic topology from knots.

360. Students' Seminar, Case Western Reserve University, February 24, 2000;
Elementary invariants of knots: from Gauss and Listing to Fox and Jones.

361. Knots in Washington, X, Japan - USA ; workshop in Knot Theory, January 23-30, 2000;
Symplectic and unitary quotients of Burau representation, and 3-move and t_3, $\bar{t}_4$-move conjectures.

362. Scottish Topology Seminar, December 3, 1999, Edinburgh, Scotland, UK,
Algebra situs: an example from knot theory.

363. Geometry-Topology Seminar, University of Warwick, England, November 18, 1999,
Skein modules and geometry of 3-manifolds.

364. Cambridge Topology Seminar, November 15, 1999,
University of Cambridge,
Skein modules of 3-manifolds with cubic relations.

365. Geometry-Topology Seminar, University of Maryland (College Park), October 25, 1999
An overview of skein modules.

366. Topology Seminar (GWU), October 21, 1999.
The first coefficient of Homflypt and Kauffman polynomials: Vertigan proof of polynomial complexity using dynamic programming.

367. Knots in Washington, IX, Conference on Knot Theory and its Ramifications, September 24-25, 1999, at the George Washington University
Positive knots and their properties.

368. AMS Special Session on The Development of Topology in the Americas, Austin, Texas, October 8-10, 1999.
Little and Haseman – early American tabulators of knots

369. Topology Seminar, Kyoto Sangyo University; August 4, 1999
Skein modules of 3-manifolds: torsion reflection of incompressible surfaces

370. The 46th Japan Topology Symposium at Hokkaido University; "One hour invited talk" July 26–29, 1999; Sapporo (Hokkaido University).
The Kauffman bracket skein algebra of a surface times the interval has no zero divisors

371. Topology Seminar, Waseda University, Tokyo, July 22, 1999.
The Kauffman bracket skein module.

372. Topology Seminar, Chuo University, Tokyo, July 7, 1999.
Algebraic topology based on knots.

373. Topology Seminar, Hiroshima University, July 6, 1999.
Torsion in skein modules.

374. Topology Seminar, Tokyo Woman's Christian University, June 26, 1999;
Kauffman bracket skein module of a connected sum of 3-manifolds.

375. Topology Seminar, Osaka University, June 21-22, 1999.
Algebraic topology based on knots, I and II.

376. AMS Special Session on Noncommutative Geometry, Quantum Groups, and Applications, Denton, Texas, May 19-22, 1999,
Homotopy quantization of skein modules.

377. Knots in Washington, VIII, conference on knot theory and its ramifications, April 30, May 1 1999,
Homotopy skein modules of 3-manifolds: an example in Algebra Situs.

378. AMS Special Session on Knot and 3-Manifolds, Buffalo, New York, April 24-25, 1999,
q-homotopy skein module of 3-manifolds; properties and applications.

379. AMS Special Session on symmetries of Knots and Three-manifolds, Las Vegas, Nevada, April 10-11, 1999.
Homotopy skein module, dichromatic polynomial and symmetry.

380. **International Conference on Geometry and Topology, 5-12 January, 1999, Technion, Haifa, Israel**
Torsion in the Kauffman bracket skein module of 3-manifolds and use of incompressible surfaces and hyperbolic structure in torsion detection.

381. **Topology seminar, Boise State University, December 15, 1998.**

382. **Fall 1998 Louisiana Topology Conference (plenary speaker), Nov. 14-15, 1998.**
Algebra Situs

383. **Knots in Washington, VII "Topology in Biology", October 23-24, 1998, at Georgetown University.**
Torsion in skein modules.

384. **Knots in Hellas – International Conference on Knot Theory and its ramifications, Delphi (Greece) August 7-15, 1998;**
Algebra Situs - algebraic topology based on knots

385. **Topology seminar, University of Frankfurt, July, 1998.**

386. **AMS Special Session on Quantum Topology during the Central Section Meeting, Kansas State University, March 27-8, 1998;**
$\mathcal{S}_{2,\infty}(H_n \# H_m; Z[A^{\pm 1}], A)$

387. **AMS Special Session on Low-dimensional topology at the Spring meeting of the American Mathematical Society, March 20-21 1998, in Louisville, KY;**
Torsion in the Kauffman bracket skein module of a 3-manifold and use of a homology group and hyperbolic structure in torsion detection.

388. **Knots, Braids, and Mapping Class Groups: A Conference in Low-Dimensional Topology in Honor of Joan Birman's 70th Birthday, Columbia University/Barnard College, New York, March 14–15, 1998.**
Algebraic topology based on knots: a case study in the history of ideas.

389. **Knot Theory Days (Knots in Washington); Sixth conference on knot theory and its ramifications, Feb. 7-9, 1998, U.S. Naval Academy Annapolis;**
On the Jones polynomial of a torus link in a solid torus.

390. **International** *Low Dimensional Topology Conference*, **Universidade Da Madeira, Portugal, January 11-17, 1998;**
Panorama of skein modules.

391. **Colloquium, Boise State University, December 1997;**
Symmetric knots.

392. **Knots in Washington; Fifth conference on knot theory and its ramifications, November 22, 1997, University of Maryland at College Park;**
Torsion in skein modules: Theorems, Conjectures and Speculations.

393. **First Graduate Fair Talk, Bowie State University, October 30, 1997. Elementary invariants of knots: from Gauss and Listing to Fox and Jones.**

394. **Knots in Washington; Fourth mini-conference on knot theory and its ramifications, April 5, 1997, University of Virginia;**
Listing's polynomial of graphs and link diagrams.

395. **AMS Special Session on Invariants of 3-manifolds, Memphis, Tennessee, March 21-22, 1997;**
The Kauffman bracket skein algebra of links and arcs.

396. **Knots in Washington: Third conference on knot theory and its ramifications, October 19, 1996;**
Kauffman bracket skein algebra of a product of a surface and interval is an integral domain.

397. **Colloquium, University of Maryland at College Park, Sept. 20, 1996;**
Introduction to Algebraic Topology Based on Knots.

398. **Knots 96, Tokyo, Japan, July 1996; Algebraic topology based on knots.**

399. **AMS-IMS-SIAM Joint Summer Research Conference: Quantization, Mount Holyoke College, July 8, 1996; Skein algebras of 3-dimensional manifolds.**

400. **AMS Special Session on Low-dimensional topology, Baton Rouge (LSU), April 19-21, 1996; Lissajous knots, billiard knots and their symmetry.**

401. **Colloquium, University of South Alabama, April 18 1996;**
Elementary invariants of knots: from Gauss to Jones.

402. **Knots in Washington; Second mini-conference on knot theory and its ramifications, March 30, 1996;**
What is new in skein modules?

403. **AMS Special Session on Topology of 3-manifolds, Iowa City, March 22-23, 1996;**
The Kauffman bracket skein algebra of links: examples and speculations.

404. **Colloquium, American University, March 1996;**
3-colorings and other elementary invariants of knots.

405. **Topology Seminar, Columbia University, November 10, 1995;**
Kauffman bracket skein algebra of a torus cross interval.

406. **Knots in Washington; mini-conference on knot theory and its ramifications, October 1995;**
(i) Knots and Braids in Gauss' notebooks,
(ii) Search for different links with the same Jones' type polynomials.

407. **Colloquium, GWU, October 1995.**
Lissajous knots, billiard knots and their symmetry.

408. Knots in Poland 1995.

409. Mini-conference on knots and braids, Göttingen (Germany), July 1995.
Skein algebra of a surface cross interval is a q-deformation of the symmetric homology.

410. Colloquium, Copenhagen University, June 1995.
3-colorings and other elementary invariants of knots.

411. University of California at Davis, Topology seminar, May 1995
Algebraic topology based on knots.

412. Plenary Talk, Cascade Mountains Topology Conference, May 1995
Boise State University; Algebraic topology based on knots

413. U.C.Berkeley (Subfactor Seminar), May 5, 1995.
Symmetry of knots: Lissajous and billiard knots;

414. MSRI (Berkeley), April 1995
Algebraic topology based on knots.

415. Topology Seminar, Warwick University, December 1994.
3-colorings and other elementary invariants of knots.

416. Fluid Mechanics Seminar, University College London, December 1994;
3-colorings and other elementary invariants of knots.

417. Colloquium, Boise State University, November 1994;
3-colorings and other elementary knot invariants

418. International Conference in Low Dimensional Topology: knots, 3-manifolds and application, Marseille-Luminy, July 20, 1994;
Algebraic topology based on knots.

419. Topology seminar, Toulouse (France), July 13, 1994; Different links with the same Jones type polynomials.

420. Topology seminar, Strasbourg (France), May 1994;
Algebraic topology based on knots.

421. Colloquium, Nantes (France), May 1994; Algebraic topology based on knots.

422. Grenoble: e.g. Fourier Institute seminar. April-May 1994;
1. Algebraic topology based on knots,
2. 3-coloring and other elementary invariants of knots

423. Banach center seminar, March 24, 1994,
W poszukiwaniu nietrywialnego węzła z trywialnym wielomianem Jonesa: grafy i mechanika statystyczna.
(In search for a nontrivial knot with trivial Jones polynomial: ideas from graph theory and statistical mechanics.

424. The first Pulikowski's Lecture, 200 lat teorii węzłów, (Two hundred years of knot theory. (Polish)), Poznań, March 1994.

425. Topology seminar, Göttingen (Germany), February 1994.

426. Odense University (Denmark), Colloquium, December 1993;
    Algebraic topology based on knots.

427. Universite Paris VII, Topology seminar, September 1993.

428. Workshop on Conformal Field Theory, Operator Algebras and Low-Dimensional Topology, Warwick, August 1993,

429. International Meeting on Knots and Links, Siegen, Germany, July 1993,

430. International Conference on algebra and topology, Kazimierz (Poland), 21 June 1993,
    Vassiliev invariants of knots; a survey from the combinatorial point of view.

431. University of California at Riverside, Topology seminar, April 1993,

432. AMS special session on Low Dimensional Topology, Washington, DC, April 1993,

433. Columbia University, New York, Topology seminar, April 2, 1993,

434. IUPUI-Indianapolis, Colloquium, March 29, 1993,

435. Conference on Quantum Topology, Kansas State University, March 1993,

436. Aarhus University, Denmark, Topology/Geometry Seminar, March 16, 1993,

437. Isaac Newton Institute for Mathematical Sciences, Program on Low Dimensional Topology and Quantum Field Theory, (Cambridge, November 1992).

438. University of Iowa, Colloquium (November 1992).

439. AMS special session on Knots and Topological Quantum Field Theory, (Dayton, October-November 1992) Nov 1, 1992.

440. Colloquium, Odense University (Denmark), 22 October 1992;
    Knot theory in 3-dimensional manifolds.

441. Georgia Topological Conference, Athens, August 1992.

442. Low-Dimensional Topology Conference, UT Knoxville, May 1992.

443. AMS special session on New Invariants of Links and 3-manifolds, Bethlehem, April 1992; Torsion in skein modules of links in 3-manifolds

444. Colloquium, Memphis State University, February 1992.

445. Workshop on Jones-Witten Invariants of 3-manifolds, Guanajuato, Mexico, December 1991.

446. Colloquium, Boise State University, November 1991; Knot theory from Vandermonde to Jones.

447. XXIV Mexican National Congress of Math., November 1991.

448. AMS special session on Knotting Phenomena in Natural Sciences, Santa Barbara, November 9-10, 1991;
Applications of the spectral parameter tangle of V.Jones

449. UT Knoxville, Topology seminar, October 1991.

450. AMS-IMS-SIAM Joint Summer Research Conference on Graph Minors, Seattle, July 1991.

451. UC Riverside, Colloquium, April 1991.

452. University of Southern California, February 1991.

453. UBC, Vancouver, Special Topology Seminar, September 17, 1990 Skein modules of open contractible 3-manifolds

454. UBC, Vancouver, Special Topology Seminar, September 10, 1990.
Skein modules of links in 3-manifolds.

455. Columbia University, Topology Seminar, May 2, 1990.
Skein module of links in $F \times I$.

456. OSU Research Seminar in Low Dimensional Topology (Columbus, Ohio), April 9, 1990.
Skein module of links in a handlebody.

457. Institute for Advanced Study, Members Seminar, February 26, 1990.
Skein modules of 3-manifolds

458. Michigan State University, October 1989.

459. University of Calgary, May 1989.

460. Columbia University, April 1989.

461. AMS special session on Knot Theory and Algebraic Geometry in the Large, Worcester M.A., April 15-16, 1989;
Skein modules of an interval bundle over a surface.

462. University of Southern California, December 1988.

463. California Institute of Technology, December 1988.

464. Lehigh University Geometry and Topology Conference, May 1988.
Skein modules of 3-manifolds.

465. Montreal (Univ. du Quebec), May 1988.

466. Montreal (Univ. du Quebec), January 1988.

467. Corvallis, Oregon, July 1987.

468. New York (Columbia Univ.-Courant Institute), April 28, 1987.

469. Houston (Rice Univ.), April 1987.

470. Austin, Texas, April 1987.

471. Karcher seminar, New polynomial invariants and periodic links, April 10, 87.

472. Karcher seminar, April 8, 1987, t_k-moves on Links

473. Karcher Special Lecture, University of Oklahoma, Norman, Oklahoma, April 7, 1987;
     New invariants in Classical Knot Theory,

474. AMS special session on Low Dimensional Topology (Honolulu, March 26-28, 1987).

475. AMS special session on Geometric Topology (Logan, October 1986).

476. Colloquium, UBC, Vancouver, October 16, 1986.
     New invariants in Classical Link Theory

477. AMS Conference on "Artin's Braid Group" (Santa Cruz, July 18, 1986).
     Conway formula for knot polynomials;

478. Ljubljana University (Slovenia), June 1986.

479. Zaragoza University, Spain, February 1986.

480. Ruhr-University (Bochum), September 1985.

481. Oberwolfach, September 13, 1985;
     Invariants of links of Conway type: algebras, polynomials, and signatures (joint work with P.Traczyk).

482. Topology seminar, November 9-10, 1984, Warsaw, Poland,
     Niezmienniki Jonesa (Invariants of Jones).

483. Warwick University, July 13-August 4, 1984;
     n-relator manifolds with incompressible boundary.

484. Durham (England), July 1-12 1984;
     Searching for a smallest volume hyperbolic 3-manifold.

485. Zaragoza University, Spain, May 29, 1984.

486. Oberwolfach, September 1983.

487. **Plenary talk at the meeting of the Polish Mathematical Society after accepting the Kuratowski Prize, Warsaw August 1983,**

488. **Zaragoza University, Spain, October 1982.**

489. **AMS special session on Low Dimensional Topology (Pittsburgh PA, August 1981).**

490. **International conference on Geometric Topology, Aug 24 – Sept. 2, 1978,**
    (My first official talk given in English)
    Z_n**-actions on some 2- and 3-manifolds,**
    To attend this conference I got a permit and a pass from the army, where I served my military service.

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Service

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1. **University Committee service:**

   (a) Research Advisory Council, Sept. 2023–

   (b) CCAS Research Advisory Committee, 2011-2013 (including CCFF awards)

   (c) The Senate Committee on Research, SCR, 2008– 2012

   (d) Advisory Council on Research, Spring semester 2009,

   (e) CSAS Committee on graduate studies, 2005-2006,

   (f) The Senate Research Committee, 2005 - 2006,

   (g) Committee to select Columbian College fellow, 2003-2004

   (h) The University Committee on Research (UCR), 2003-2006, (including UFF and Dilthey prizes)

   (i) Advisory Council on Research; 2000–2003

   (j) Research Committee of Faculty Senate 2000-2001

   (k) Patent and Scholarly Works Panel (March, 2001)

   (l) Member of the committee (CSAS) selecting the award winners for 1997-1998 Exemplary Paper Award

2. **Department Committee service:**

   (a) The Undergraduate Program Committee (1995-96).

   (b) Department of Mathematics Ad Hoc Committee for fundraising (1995-96). It prepared the departmental response in connection with the 175th anniversary of the university fundraising campaign.

   (c) Ad Hoc Scheduling Committee (1996).

   (d) Department's Committee for the proposed University's Computational Sciences Program (1996-1999).

   (e) The Graduate Committee (1996-1998).

      (i) Active participant in the recruitment of new graduate students.

      (ii) Master and PhD Preliminary Written Examination coordinator. Grader of written examination in Topology (with Y.Rong); two examinations per year.

(f) Colloquia Chair (and member of Personnel Committee) 1998-99.

(g) The Graduate Committee (2000-2004, 2011-2013).

(i) Recruting Com. (2000).

(h) Outside Chair search committee (2005-2006).

(i) Poster presentations

  (u) Classical roots of Knot Theory, Scholars Showcase, GWU, March, 1998.

  (uu) Algebra Situs, Scholars Showcase, GWU, January, 1999.

  (uuu) Research Gallery of Inauguration Week's Research Day (Wednesday, November 14th);

(t) Putnam training session. November 29, 2000.

3. **Community Service**

(a) Four lectures in mathematics for high school students in the Polish Saturday's school (Washington); (Spring 1996).

(b) Six lectures in mathematics for high school students and three lectures for middle school students in the Polish Saturday's school (Washington); (Spring 1997).

(c) Consultation. Polish edition of Scientific American ("W świecie nauki").

(d) Mentoring:
Doug Bullock (NSF postdoc, 1997-8),
Akira Yasuhara (Japanees Academy of Science postdoc, 1999-2001),
Makiko Ishiwata (visiting graduate student, from TWCU, Japan, 2001, and March/April 2002, visiting after PhD, September 2005),
Marta M. Asaeda (postdoc at UMCP, but practically she was my postdoc at GWU; 2001-2003).
Marithania Silvero Casanova (2013-2019).

(d) NSF panels:
(i) NSF panel in Low Dimensional Tolopogy, February 15-17, 2007.
(ii) NSF Panel on NSF/CBMS Regional Research Conferences, June 8-9, 2007.

(e) Member of W.A.S. judging panel at the Paint Branch High School Science EXPO: Friday December 14th, 2007.

(f) Member of W.A.S. judging panel at the Paint Branch High School Science EXPO: December 12th, 2008.

(g) Member of W.A.S. judging panel at the Montgomery Blair High School Magnet Research Convention (MRC), April 16, 2009.

(h) Member of W.A.S. judging panel at the science fair at Blair Science Magnet High School, January 11, 2018.

(j1) A judge during Research Days 2016 (GWU).

(j2) A judge during Research Days April 2017(GWU).

(j3) A judge during Research Days April 10, 2018(GWU).

(j4) A judge during Research Days April 9, 2019(GWU).

DESCRIPTION of RESEARCH INTERESTS
Józef H. Przytycki

Classical knot theory, topology of 3-manifolds, algebraic topology based on knots and related topics (e.g. graph theory, hyperbolic geometry, universal algebras, statistical mechanics, representations of Lie algebras and Hopf algebras, Hecke algebras, Khovanov homology, topological quantum field theory, character varieties, Hochschild homology, cyclic homology, Yang-Baxter homology, history of topology).

My goal is to build an algebraic topology based on knots; that is a consistent theory in which links play the role of cycles, skein modules the role of homology groups and link invariants the role of cohomology.

1. Generalizations of the Jones polynomial.

   In 1984, I discovered (with P.Traczyk) a 2-variable generalization of the Jones polynomial (it was discovered independently by P.Freyd and D.Yetter, J.Hoste, R.Lickorish and K.Millett, and A.Ocneanu). Our main idea was to construct a universal algebra (which we called the Conway algebra) which utilize the skein relation observed by Conway and Jones. Any Conway algebra yields a link invariant, in particular we obtained the generalized Jones polynomial and a polynomial of infinitely many variables [14],[15]. I proved that the polynomial of infinite many variables can be used to obtain an invariant of link homotopy which sometimes works better than the generalized Jones polynomial [59]; it was conjectured before that such an invariant does not exist. We analyzed (with P.Traczyk) the properties of Conway algebras and their relations with the signature of links. We proved that the Tristram - Levine signature is, essentially, the skein invariant and we conjectured the existence of "the supersignature" which generalizes the Tristram - Levine signature and could be used to prove the Milnor's unknotting conjecture (theorem) for positive braids [15].

2. Search for different links with the same Jones type polynomials: cabling, rotors, spectral parameter tangles.

   I proved in 1986 that the $(2, k)$ cables of knot mutants have the same skein (generalized Jones) polynomial. I showed also that knots $K_1 \# K_2$ and $K_1 \# - K_2$ cannot be distinguished by considering skein or Kauffman polynomials of their satellites [23] (the above results were also discovered independently by R.Lickorish). These results can be used as a criterion to check whether polynomial invariants obtained from representations of some "nonstandard" Lie algebras give genuinely new link invariants and whether Vassiliev-Gusarov invariants are genuinely better than Jones type polynomials. Furthermore the above result can be used (as observed by J.Kania-Bartoszynska and R.Lickorish) to construct different 3-manifolds with the same Witten and Reshetikhin-Turaev invariants.

   I worked with R.Anstee and D.Rolfsen on generalized mutation ("rotation") of links and we proved several properties of rotants [20]. Recently I showed that ro-

tors and examples obtained by Jones (different links with the same Jones type polynomials) using spectral parameter tangles have a common generalization [42,47]. The spectral parameter tangle corresponds to the spectral parameter in the Yang-Baxter equation. Further development of this concept is described in [**7p**].

3. **Applications of Jones type polynomials: periodic links, Lissajou knots, billiard knots, braid index.**

I was working on periodic links and I found criteria for n-periodic links using the skein (Homflypt, generalized Jones) and Kauffman polynomials [**22**]. Later, I found a simple proof of the powerful Traczyk-Yokota criteria of knot periodicity and a version of these criteria which uses the Kauffman polynomial [**43**]. I found also applications of Vassiliev knot invariants to study of knot's periodicity [**38**].

I am thinking now about applying Khovanov homology and quandle homology to knot periodicity.

I analyzed Lissajous (and billiard) knots and I found that the Alexander polynomial of a Lissajous knot is a square modulo 2 (it generalized the previous criterion of V.Jones) [**51**].
In the recent paper (with J.Kania Bartoszyńska and Pat Gilmer), we have found the application of the Witten-Reshetikhin-Turaev invariants to study of symmetry of 3-dimensional manifolds [**66**].

I worked (with K.Murasugi) on determination of braid index of links. We developed some concepts in graph theory needed for our work (index of a graph) We conjectured that the braid index of an alternating link L is equal to the number of Seifert circles of an alternating diagram D_L of L minus the index of D_L. We proved the conjecture for a large class of alternating links [**37**]. We found also examples of alternating links for which Morton-Franks-Williams inequalities do not become equalities (as in all previously known cases). In the actual computation (performed by J.Hoste) of the skein (Homflypt) polynomial we used ideas from [**34**] on the computational complexity of Jones type invariants.

4. t_k-**moves**

I have been analyzing the so-called t_k moves (k-twists) on links and the problem whether two links are equivalent by these moves, and if yes, how many moves are needed. The new polynomial link invariants are the perfect tool to study these questions [**16**]. I also analyzed the behavior of the first homology group of branched cyclic covers under t_k moves [**16**],[**17**]. I obtained the nice corollary which relates the tricoloring of Fox and the Jones (and Kauffman) polynomials of links (at sixth root of unity) [**35**],[**49**].

5. **Properties of Jones type polynomials**

I have been analyzing diagrams for which Morton-Franks-Williams inequalities become equalities. I have proved (with K.Murasugi) that the coefficient in the

highest power of z in the skein polynomial is multiplicative under planar star product [24].

6. **Khovanov homology**

Original Khovanov homology was defined (in 1997) for links in S^3, as a categorification of the Jones polynomial of classical links. We generalized the definition (with M.M.Asaeda and A.S.Sikora) to some other 3-dimensional manofolds (I bundles over surfaces). We showed also how to stratify Khovanov homology in order to categorify the Kauffman bracket skein module (in $M = I\tilde{\times}F$ case). I studied also (with M.M.Asaeda) torsion in Khovanov homology [A-P] proving Shumakowitch "torsion" conjecture for a class of adequate links. Later (May 2005) I noticed the connection between Khovanov homology and Hochschild homology. I am analyzing this connection and its consequences. In particular we use the connection to compute some Khovanov homology of links and graphs, and analyze their torsion. In the winter 2016/17 I discovered with my students new torsion in Khovanov homology, Z_9 and Z_{2^k} for $k \leq 23$. We now conjecture that any finitely generated torsion group can be a torsion group of a link of braid index four.

7. **Algebraic topology of knots in 3-manifolds**

   (a) I tried to construct a "multilabel" Jones polynomial, with a partial success [21], but then I realized that the proper idea is to associate to each 3-manifold a module over the ring of polynomials (I have called it *skein module*). The existence of the generalized Jones (skein) polynomial for S^3 is equivalent to the fact that the third skein module of S^3 ($\mathcal{S}_3(S^3)$) is equal to the one generator free module. $\mathcal{S}_3$ is a well defined object but it is very difficult to compute. The only nontrivial results known before (after a proper interpretation) where for S^3 and $S^1 \times D^2$ (Hoste and Kidwell, Turaev). I outlined the theory of skein modules in [28]. The skein module $\mathcal{S}_3(M)$ (respectively $\mathcal{S}_{2,\infty}(M)$) is a straightforward generalization of the skein (Homfly) (resp. Jones) polynomial to any 3-manifolds. We have found (with J.Hoste) the $(2,\infty)$-skein module of lens spaces. Namely we proved that $\mathcal{S}_{2,\infty}(L(p,q))$, for $p > 1$ is a free $Z[A^{\pm 1}]$ module with $\lfloor \frac{p}{2} \rfloor + 1$ generators (here $\lfloor x \rfloor$ is the greatest integer function). Additionally we showed that $\mathcal{S}_{2,\infty}(S^1 \times S^2)$ is infinitely generated but the torsion free part of it is free on one generator [36]. We completed the computation of the $\mathcal{S}_{2,\infty}(S^1 \times S^2)$ in [41]. I have analyzed (with J.Hoste) the structure of $(2,\infty)$-skein module of open contractible 3-manifolds. For an uncountable collection of open contractible 3- manifolds, each constructed in a fashion similar to that of the Whitehead manifold, we prove that their $(2,\infty)$-skein modules are infinitely generated, torsion free but not free. To each of these manifolds one may associate a subgroup G of the rationals which may be interpreted via wrapping numbers (McMillan group). We show that the skein module has a natural filtration by modules indexed by G. These examples stand in stark contrast to R^3, whose $(2,\infty)$-skein module is free on one generator [40].

(b) I have proven that the skein module of the handlebody, $\mathcal{S}_3(H_n)$, is a free module with a natural basis, solving the conjecture by **V.Turaev** and myself (for D^3 it is equivalent to the existence of the skein (Homfly) polynomial and for $S^1 \times D^2$ it has been solved by **J.Hoste** and **M.Kidwell**, and **V.Turaev**). The proof consists of a delicate multistep induction which incorporates, in addition to ideas from knot theory, the method used in the classical proof of the Poincaré-Birkhoff-Witt theorem on universal enveloping algebras of Lie algebras. Of interest is also the structure of descending diagrams of links and description of $\mathcal{S}_3$ as a quantization of the "anti-homotopy" skein module (analyzed together with **J.Hoste**). I extended the above results to any closed surface cross interval using Hass, Scott and Grayson results on curvature flow on surfaces [31].

(c) I have proven that the skein module of links in $F \times I$, $\mathcal{S}_3(F \times I)$, where F is a planar surface, is a Hopf algebra (i.e. quantum group) with the standard multiplication ($L_1 L_2$ means the link obtained by placing L_1 above L_2 in $F \times I$), comultiplication of Jaeger-Turaev and antipode related to the mirror image. It settles a conjecture of **V.Turaev** [32].

(d) I analyzed the behavior of skein modules under connected sum and disc sum and found that in the case of a field of rational functions the skein module of connected sum is equal to the tensor product of skein modules of factors. Generally (up to Poincare Conjecture) the skein module of the connected sum of 3-manifolds has a torsion. In the case of the disc sum the behavior of skein modules reminds combinatorics of Topological Quantum Field Theories.

(e) I have investigated the skein module approach to Vassiliev-Gusarov invariants of knots and I have found, probably, the first concrete application of Vassiliev-Gusarov invariants (to knot's periodicity) [38].

(f) The skein modules could play the role similar to homology or homotopy groups in algebraic topology. They can be thought as quantizations of the fundamental group or the first homology group of a 3-manifold. Combinatorial methods were sufficient to compute $\mathcal{S}_3$ for S^3 and the solid torus and $\mathcal{S}_{2,\infty}$, for I-bundles over surfaces and lens spaces. For more computations some more sophisticated methods were needed: For example the Goldman-Wolpert Lie algebra build on homotopy classes of oriented closed curves, $\hat{\pi}$, on a surface F and the Poincaré-Birkhoff-Witt theorem gave a hint into the analysis of the third skein module of a handlebody $\mathcal{S}_3(H_n)$ (see [31]). I am working now on the Conjecture that the third skein module ($\mathcal{S}_3$) of an oriented, compact, irreducible, atoroidal 3-manifold is isomorphic to the symmetric tensor algebra of the module over conjugacy classes of nontrivial elements of the fundamental group of the manifold. I proved it for $F \times I$) [31] and it seems to hold also in the case of lens spaces [8p].

In recent papers (with **A.Sikora**) [50,55,11p] we introduced the concept of a skein algebra of a group (for a 3-manifold group, the Kauffman bracket skein module is a quantization of the algebra). We started systematic study of algebras (and its relations with $SL(2, C)$ character varieties) in particular proving

that the minimal number of generators of the free group F_d is equal to $2^d - 1$. We proved, for surface groups, the Bullock conjecture, that the skein algebra of $F \times I$, for $A = -1$, is isomorphic to the coordinate ring of the character variety of the fundamental group of the surface F.

We found also the first nontrivial relation between Jones type invariants and hyperbolic structures on 3-manifolds.

In a 1995 work with D.Bullock [54], we have found the exact structure of the Kauffman bracket skein algebra of $F \times I$ for surfaces with small Euler characteristic (including torus and a disk with 3 holes).

8. Positive and almost positive knots

In [24], I analyzed the signature of positive knots. Recently (when the first version of the vita was written in 1991), with K. Taniyama, I generalized results from [24] and proved, for example, that [6p]

- unknotting number 1 positive knots are twist knots,

- a knot with a diagram of no more than 2 negative crossings has negative signature or is a twist knot.

9. Computational complexity of Jones-type polynomials

I worked on relations between polynomials of knots and graphs [34]. In particular, I analyzed (with T. Przytycka) how much of Jones-type polynomials can be computed in subexponential time (generally computing Jones-type invariants is #P-hard) [34]. This work found many application when knots of several (> 35) crossings were considered. From perspective this work is important as it may be treated as a precursor of Vassiliev invariants (some truncations of Jones type invariants, considered in [34] are exactly Vassiliev parts of Jones type invariants).

10. Topological Graph Theory

I analyzed (with T.Przytycka) some problems of topological graph theory [26,33,44] solving in particular the problem of triangulations of surfaces without short non-contractible cycles. A fundamental conjecture from these papers was solved in 2015.

I have analyzed completions of graph algebras which are Hopf algebras and are related to Vassiliev invariants of links [3p].

11. Quandles and their homology

I am actually trying to compute completely the second quandle homology of odd quasigroup kei, Q. It is related with exterior algebra of ZQ. Done in a paper with Maciej Niebrzydowski [99]. In 2015, I have proven with my PhD student Seung Yeop Yang that reduced quandle (and rack) homology of a finite quasigroup quandle is annihilated by its order [111]

12. **Homology of Yang-Baxter operators** In this reseach I am looking for connections between Khovanov homology and Homology of Yang-Baxter operators (compare [**122,125**]).

13. **Incompressible surfaces**

   My PhD thesis was concentrated on incompressible surfaces in 3-manifolds, with the main result (from the perspective of 12 years): "Handle addition Lemma". I would like to finish our (with M.Lozano) classification of incompressible surfaces in the complements of closed 3-braids. I would like to find all Dehn fillings of punctured torus bundles over S^1 which produce lens spaces, or more generally, Seifert manifolds. The idea is to use Thurston-Hatcher-Floyd method of finding incompressible surfaces, to, not necessarily incompressible, surfaces. Examples which will arise can be of interest for people generalizing "cyclic surgery theorem" and working on related topics. It would be also of interest to find an alternate proof of the classification of closed 3-braids (obtained by J.Birman and W.Menasco) using incompressible surfaces in 3-braid's exterior. The structure of skein modules of 3-manifolds seems to be reflecting the geometric structure of these manifolds. For example one of the simplest skein modules is torsion free iff the manifold does not contain a nonseparating torus or a sphere. This seems to be leading to exciting research.

A brief description of proposed research.

My goal is to build an algebraic topology based on knots; that is a consistent theory in which links play the role of cycles, and skein modules the role of homology groups. Witten-Reshetikhin-Turaev-Wenzl invariants of 3-manifolds should correspond to some characteristic elements of cohomology groups. This is a far-reaching program. Until now we have been limited to 3-manifolds, with only a glance towards 4-manifolds, and our skein modules correspond to H_1 of manifolds (often being a quantization of H_1). The situation is somehow reminiscent of that of "classical" algebraic topology 120 years ago (before Poincaré's fundamental paper "Analysis Situs", 1895). At present we are able to compute a few isolated examples, but there are already signs that it will rise in future to a beautiful and powerful theory.

A personal statement about my research career to date and aspirations in the long-term.

My research concentrated on topology of low dimensional manifolds:

1. **Cyclic actions on 2 and 3-manifolds.**
   This resulted in my Master Degree Thesis and in my constant interest in symmetry of manifolds (I have written a survey of methods applicable for symmetric links and 3-manifolds [52]).

2. **Incompressible surfaces in 3-manifolds.**
   My main results are related to the "Handle addition Lemma". This result, motivated by the question of when incompressibility of surfaces survives a Dehn surgery, unleashed a whole industry which culminated in the proof of the R-conjecture (by Gabai) and the Tietze conjecture (by Gordon and Luecke). Scharlemann first tested his powerful technique on a generalization of my lemma.

3. **3-dimensional hyperbolic manifolds.**
   I worked intensively on the topic for a short time (1982) but my suggestion that the Thurston example (5/1 surgery on the figure eight knot) is not the 3-manifold of the smallest hyperbolic volume was correct. I conjectured that the smallest volume hyperbolic 3-manifold is obtained by a surgery on the punctured torus bundle over S^1 with monodromy being minus that of the figure eight knot. This is still the example with the smallest volume. When working on knot theory in 3-manifolds I always have the Thurston geometrization conjecture in background. D.Gabai proved the conjecture and will speak about it at the International Congress of Mathematicians in Summer of 2010.

4. **Knot theory in 3-manifolds.**
   I was one of the co-inventors of generalized Jones polynomials and I analyzed several of their properties. However, I believe, my most important work was done in the theory of skein modules of 3-manifolds. It is still restricted to examples but my result that the third skein module of a surface cross the unit interval is, on the one hand, a module isomorphic to the symmetric tensor algebra over conjugacy

classes of the fundamental group, and on the other hand has a structure of a non-commutative non-cocommutative Hopf algebra, seems to point the way for future research.

5. **Algebraic topology based on knots.**
   I imagine that this will relate to vast regions of mathematics including, besides the knot theory, geometric and algebraic topology, statistical mechanics, quantum groups and their representations, topological quantum field theory etc.

After traveling for 8 years and visiting several of the best mathematical centers (including Princeton and Berkeley), I would like here, at George Washington University, participate in the growth of a mathematical school in which "Algebraic topology based on knots" would be an important theme. It would include:

1. Graduate students (I have/had already outstanding students (e.g. Adam Sikora, Maxim Sokolov, Tatsuya Tsukamoto, Qi Chen, Mietek Dąbkowski, Maciej Niebrzydowski, Radmila Sazdanovic), and I am actively trying to recruit the best students in the world). I am talking to students at conferences, asking my friends mathematicians about possiblity of having their master students studying for PhD at GWU. Our newest (2005) students in PhD program were recruited in such a way. Radmila Sazdanovic gave (very good) talk at my conference Knots in Washington and Milena Pabiniak was recomended by her master degree advisor A. Pierzchalski, my friend from Lodz, Poland. Actually (March 2015) I have 5 PhD students (Jing Wang defended his thesis March 23, 2015;
Thesis Title: Homology of Small Categories and Its Applications
Seung Yeop Yang (PhD May 2017, George Washington University);
PhD students (as of April 2017):
(1) Xiao Wang (fourth year PhD student); Taylor Prize March, 2017. (Defended his thesis in 2018).
(2) Sujoy Mukherjee (third year PhD student); (Will defend his thesis in February 2019)
(3) Harpreet Bedi (third year PhD student); co-adviser with Yongwu Rong. (Defended his thesis in 2018).
(4) Rhea Palak Bakshi (first year PhD student). (Expected to finish her PhD in 2021).
(5) Dionne Kunkel (second year PhD student in January 2019).

2. Research seminars, projects directed toward undergraduate students, writing textbooks (lecture notes prepared for my graduate course Topic Course in Topology will be a starting point for my planned book: *Introduction to Algebraic Topology Based on Knots*)

3. Organizing conferences (I co-organized sixteen special sessions at AMS meetings, I am co-organizing every semester a conference *Knots in Washington*; for example the

one which took place in February 98 had about 40 participants (with J.Birman, T.Le and L. Feng as plenary speakers); the conference: KNOTS in WASHINGTON 10 Japan - USA ; workshop in Knot Theory, January 23-30, 2000, had about 35 speakers from 8 countries, including speakers from Japan, Korea, Russia, France, Italy, Slovenia and Colombia.

Knots in Washington XVII; Khovanov Homology (May 2004) was supported by a grant from NSF. We had 5 plenary spekers – leading specialists in quickly emerging field of *Khovanov homology*: M.Khovanov (he gave three talks), D.Bar-Natan, L.Rozanski, A.Shumakovitch and O.Viro. In November 2004, we organized Knots in Washington XIX: Topology in Biology, were recent ideas of applying knot theory to biology were discussed. Also February 2005 conference: Knots in Washington XX (60th birthday of Louis H. Kauffman) was an unqualified success with famous speakers (again including Khovanov and Viro and also Morton and Murasugi).

4. Mathathon with my graduate students: 10 days in December devoted to intensive work on some, chosen in advance, mathematical problem. We had already 4 Mathathons and wrote several papers as a result (e.g. [119,123,127].

5. Informing the general public on mathematical activity.

I am open to collaboration with other people and I have written several joint papers e.g. with R.Anstee, M.M.Asaeda, R.P.Bakshi, S.Betley, D.Bullock, Q.Chen, Z.Cheng, A.Christiana, M.A.Dąbkowska, J.Dymara, M.K.Dąbkowski, P.Gilmer, A. Guo, V.S.Harizanov, L.Helme-Guizon, J.Hoste, D.Ibarra, M.Ishiwata, W.Jakobsche, F.Jaeger, T.Januszkiewicz, V.F.R.Jones, J.Kania-Bartoszyǹska, L.Kauffman, S.Lambropoulou, A.Landry, M.Lozano, W.J.R.Mitchell, G.Montoya-Vega, S.Mukherjee, K.Murasugi, M.Niebrzydowski, T.Nosaka, M.D.Pabiniak, T.M.Przytycka, D.Repovs, D.Rolfsen, Y.Rong, W.Rosicki, R.Sazdanovic, A.S.Sikora, D.Silver, M.Silvero, M.Sokolov, K.Taniyama, A.A.Togha, T.Tsukamoto, P.Traczyk, M.A.Veve, X.Wang, D.Weeks, S.Williams, S.Y.Yang,