# Linsey Christine Seitz

Assistant Professor
linsey.seitz@northwestern.edu
https://sites.northwestern.edu/seitzlab/
+1 847 467 3056

Department of Chemical and Biological Engineering
Northwestern University
2145 Sheridan Road, Room E136
Evanston, Illinois 60208

## Education

Stanford University, Stanford, CA
M.S. / Ph.D. Chemical Engineering 2013 / 2015
Michigan State University, East Lansing, MI
B.S. Chemical Engineering with a Biomedical Engineering Option 2010
Honors College, Alumni Distinguished Scholarship – *Full Ride & room/board/books stipend*

## Professional Appointments

Assistant Professor 2018 – *present*
Northwestern University, *Department of Chemical and Biological Engineering*
Post-Doctoral Research Fellow 2016 – 2018
Karlsruhe Institute of Technology, *Institute for Photon Science and Synchrotron Radiation*
Post-Doctoral Research Associate 2015 – 2016
Stanford University, *Department of Chemical Engineering*

## Honors & Awards *(after 2010)*

ACS CATL Early Career Award 2024
Emerging Investigator / Rising Star Accepted Journal Invitations
*J. Mater. Chem. A* 2024
*Materials Horizons* 2024
*ACS Sustain. Chem. Eng.* 2023
*J. Phys. Chem. C* 2023
*Energy and Fuels* 2023
Northwestern University Associated Student Government Faculty Honor Roll 2022
NSF Faculty Early CAREER Award 2022
AIChE Pioneer of Catalysis and Reaction Engineering 2021
RCSA Scialog Fellow 2019, 2020, 2021
Helmholtz Postdoc Program Fellowship 2016 – 2018
Diversifying Academia, Recruiting Excellence (DARE) Doctoral Fellowship 2013 – 2015
National Science Foundation Graduate Research Fellowship 2010 – 2013

## Publications in Peer-Reviewed Journals

* Corresponding author: 20, † Joint first author, % Undergraduate author
Total Number of Publications: 43 ORCID ID: 0000-0001-6831-6747

### *After 2018*

1. J. Edgington, R. Vicente, S. Vispute, R. Li, M. Sweers, S. Sullivan%, P. Fernandez, L. C. Seitz*, "Dynamics of Highly Active $Ln_3IrO_7$ Catalysts for the Oxygen Evolution Reaction in Acid," *Adv. Energy Mater.,* **2024**. (DOI: 10.1002/aenm.202402333)
2. B. N. Ruggiero, B. Lu, X. K. Lu, A. E. Deberghes, D. Nordlund, J. M. Notestein, L. C. Seitz*, "Efficient Electrosynthesis of Hydrogen Peroxide in Neutral Media using Boron and Nitrogen Doped Carbon Catalysts," *J. Mater. Chem. A,* **2024**. (DOI: 10.1039/D4TA04613G)
3. A. Deberghes, M. Kazour, J. M. Notestein, L. C. Seitz*, "Chlorine Mediated Oxidation of Cyclohexene at High Current Density in a Liquid Diffusion Electrode Reactor," *ACS Catal.*, **2024**, 14, 12128-12139. (DOI: 10.1021/acscatal.4c03356)

4. S. Salaria, B. Ruggiero, A. Deberghes, L. C. Seitz, J. M. Notestein*, "Biphasic Selective Oxidation of Cyclohexene with Dilute Aqueous Hydrogen Peroxide using Phase Transfer Catalysts," *Indust. Eng. Chem. Res.*, **2024**, 63(32), 14074–14082. (DOI: 10.1021/acs.iecr.4c01988)

5. B. Lu, C. Wahl, R. dos Reis, J. Edgington, X. K. Lu, R. Li, M. Sweers, B. Ruggiero, G. T. K. K. Gunasooriya, V. Dravid, L. C. Seitz*, "Key Role of Paracrystalline Motifs on Iridium Oxide Surfaces for Acidic Water Oxidation," *Nat. Catal.*, **2024**, 7, 868-877. (DOI: 10.1038/s41929-024-01187-4)
   + Featured in *Nature Catalysis* Research Briefing (DOI: 10.1038/s41929-024-01201-9)

6. M. E. Sweers, J. Shen, T. Liu, B. Lu, Q. Ma, J. Freeland, C. Wolverton, G. Gonzalez-Avilez, L. C. Seitz*, "Synthesis and Symmetry of Perovskite Oxynitride $CaW(O,N)_3$," *Mater. Horiz.,* **2024**, 11, 4104-4114. (DOI: 10.1039/D4MH00317A)

7. M. E. Sweers, Q. Ma, P. Donahue, D. Nordlund, S. M. Haile, L. C. Seitz*, "Epitaxial strain-tuned oxygen vacancy formation, reduction behavior, and electronic structure of perovskite $SrIrO_3$," *Phys. Rev. Mater.*, **2024**, 8(5), 055801. (DOI: 10.1103/PhysRevMaterials.8.055801)

8. B. N. Ruggiero[†], X. K. Lu[†], K. Adonteng[%], J. Dong[%], J. M. Notestein, L. C. Seitz*, "Local Reaction Microenvironment Impacts on $H_2O_2$ Electrosynthesis in a Solid Electrolyte Dual Membrane Electrode Assembly," *Chem. Eng. Journal*, **2024**, 486, 150246. (DOI: 10.1016/j.cej.2024.150246)

9. R. Li, B. Lu, J. A. Edgington, L. C. Seitz*, "Dynamic Interactions Between Adsorbates and Catalyst Surfaces over Long-term OER Stability Testing in Acidic Media," *J. Catal*., **2024**, 431, 115387. (DOI: 10.1016/j.jcat.2024.115387)

10. R. Li, D. Nordlund, L. C. Seitz*, "Material Dynamics of Manganese-Based Oxychlorides for Oxygen Evolution Reaction in Acid," *Chem. Mater.*, **2024**, 36(3), 1299-1307. (DOI: 10.1021/acs.chemmater.3c02362)

11. A. Deberghes, B. N. Ruggiero, J. M. Notestein, L. C. Seitz*, "Water Based Electrooxidation of Cyclohexene in a Novel Liquid Diffusion Electrode Reactor Design," *ACS Sustain. Chem. Eng.,* **2023**, 11(48), 16893-16901. (DOI: 10.1021/acssuschemeng.3c04020)

12. B. N. Ruggiero, A. R. Weidner, J. M. Notestein, L. C. Seitz*, "Observing Local pH Changes Using a Rotating Ring-Disk Electrode Functionalized with a Potentiometric pH Sensing Probe," *J. Phys. Chem. C*, **2023**, 127(42), 20640-20651. (DOI: 10.1021/acs.jpcc.3c04390)

13. R. Li, J. Edgington, L. C. Seitz*, "Degradation Mechanism of Calcium Iridium Oxide for Oxygen Evolution Reaction in Acid," *Energy and Fuels,* **2023**, 37(17), 13554–13561. (DOI: 10.1021/acs.energyfuels.3c01743)

14. J. Edgington, L. C. Seitz*, "Advancing the Rigor and Reproducibility of Electrocatalyst Stability Benchmarking and Intrinsic Material Degradation Analysis for Water Oxidation," *ACS Catal.,* **2023**, 13(5), 3379-3394. (DOI: 10.1021/acscatal.2c06282)
   + Invited Perspective

15. L. C. Seitz*, D. E. Doronkin, D. Hauschild, M. Casapu, D. Zengel, A. Zimina, D. Kreikemeyer-Lorenzo, M. Blum, W. Yang, J-D Grunwaldt, C. Heske, L. Weinhardt*, "Direct Observation of Reactant, Intermediate, and Product Species for Nitrogen Oxide Selective Catalytic Reduction on Cu-SSZ-13 using *in situ* Soft X-Ray Spectroscopy," *J. Phys. Chem. C,* **2022**, 126(49), 20998-21009. (DOI: 10.1021/acs.jpcc.2c04736)

16. E. Goldfine, J. Wenderott, M. Sweers, S. Pandey, L. C. Seitz, M. Bedzyk, S. Haile*, "Molybdenum Oxide Precursors that Promote Low Temperature Formation of High Surface Area Cubic Molybdenum (Oxy)Nitride," *Inorg. Chem.*, **2022***,* 61(42), 16760-16769. (DOI: 10.1021/acs.inorgchem.2c02603)

17. J. Edgington, A. Deberghes, L. C. Seitz*, "Glassy Carbon Substrate Oxidation Effects on Electrode Stability for Oxygen Evolution Reaction Catalysis Stability Benchmarking in Acid," *ACS Appl. Energy Mater.,* **2022**, 5(10), 12206-12218. (DOI: 10.1021/acsaem.2c01690)

18. B. N. Ruggiero, K. M. Sanroman Gutierrez[%], J. D. George, N. M. Mangan, J. M. Notestein, L. C. Seitz*, "Probing the Relationship Between Bulk and Local Environments to Understand Impacts on Electrocatalytic Oxygen Reduction Reaction," *J. Catal.*, **2022**, 414, 33-43. (DOI: 10.1016/j.jcat.2022.08.025)

19. K-Y Park[†], M. E. Sweers[†], U. Berner, E. Hirth, J. R. Downing, J. Hui, J. Mailoa, C. Johnston, S. Kim, L. C. Seitz*, M. C. Hersam*, "Mitigating Pt loss in Polymer Electrolyte Membrane Fuel Cell Cathode Catalysts using Graphene Nanoplatelet Pickering Emulsion Processing," *Adv. Funct. Mater.*, **2022**, 32, 2205216. (DOI: 10.1002/adfm.202205216)

20. B. Lu, C. B. Wahl, X. K. Lu, M. E. Sweers, H. Li, V. P. Dravid, L. C. Seitz*, "Iridium incorporated Strontium Tungsten Oxynitride Perovskite for Efficient Acidic Hydrogen Evolution," *J. Am. Chem. Soc*., **2022**, 144(30), 13547-13555. (DOI: 10.1021/jacs.2c03617)

21. X. K. Lu, B. Lu, H. Li, K. Lim[%], L. C. Seitz*, "Stabilization of Undercoordinated Cu Sites in Strontium Copper Oxides for Enhanced Formation of $C_{2+}$ Products in Electrochemical $CO_2$ Reduction," *ACS Catal*., **2022**, 12(11), 6663-6671. (DOI: 10.1021/acscatal.2c01019)

22. J. Edgington, N. Schweitzer, S. Alayoglu, L. C. Seitz*, "Constant Change: Exploring Dynamic Oxygen Evolution Reaction Catalysis and Material Transformations in Strontium Zinc Iridate Perovskite in Acid," *J. Am. Chem. Soc.*, **2021**, 143(26), 9961-9971. (DOI: 10.1021/jacs.1c04332)

23. N. C. Kani, J. A. Gauthier*, A. Prajapati, J. Edgington, I. Bordawekar, W. Shields, M. Shields, L. C. Seitz, A. R. Singh*, M. R. Singh*, "Solar-Driven Electrochemical Synthesis of Ammonia using Nitrate with 11% Solar-to-Fuel Efficiency at Ambient Conditions," *Energy Environ. Sci.*, **2021**, 14(12), 6059-6680. (DOI: 10.1039/D1EE01879E)

24. C. Kamal*, D. Hauschild, L. C. Seitz, R. Steininger, W. Yang, C. Heske, L. Weinhardt*, M. Odelius*, "Coupling Methylammonium and Formamidinium Cations with Halide Anions: Hybrid Orbitals, Hydrogen Bonding, and the Role of Dynamics," *J. Phys. Chem. C*, **2021**, 125(46), 25917-25926. (DOI: 10.1021/acs.jpcc.1c08932)

25. D. Hauschild*, L. C. Seitz, S. Gharibzadeh, R. Steininger, N. Jiang, W. Yang, U. W. Paetzold, C. Heske, L. Weinhardt*, "Impact of n-Butylammonium Bromide on the Chemical and Electronic Structure of Double-Cation Perovskite Thin Films," *ACS Appl. Mater. Interfaces*, **2021**, 13(44), 53202-53210. (DOI: 10.1021/acsami.1c15707)

26. D. Hauschild*, S. J. Wachs, W. Kogler, L. C. Seitz, J. Carter, T. Schnabel, B. Krause, M. Blum, W. Yang, E. Ahlswede, C. Heske, L. Weinhardt*, "Chemical Structure of a Carbon-Rich Layer at the Wet-Chemical Processed $Cu_2ZnSn(S,Se)_4$/Mo Interface," *IEEE J Photovoltaics*, **2021**, 11(3), 658-663. (DOI: 10.1109/jphotov.2021.3059423)

27. A. E. A. Fouda, L. C. Seitz, D. Hauschild, M. Blum, W. Yang, C. Heske, L. Weinhardt*, N. A. Besley*, "Observation of Double Excitations in the Resonant Inelastic X-ray Scattering of Nitric Oxide," *J. Phys. Chem. Lett.*, **2020**, 11, 7476–7482. (DOI: 10.1021/acs.jpclett.0c01981)

***Before 2018***

28. R. Frydendal, L. C. Seitz, D. Sokaras, T-C Weng, D. Nordlund, I. Chorkendorff, I. E. L. Stephens*, T. F. Jaramillo*, "*Operando* Investigation of Au-$MnO_x$ Thin Films with Improved Activity for the Oxygen Evolution Reaction," *Electrochim. Acta*, **2017**, 230, 22-28. (DOI: 10.1016/j.electacta.2017.01.085)

29. J. H. Montoya, L. C. Seitz, P. Chakthranont, A. Vojvodic, T. F. Jaramillo, J. K. Nørskov*, "Materials for Solar Fuels and Chemicals," *Nat. Mater.*, **2017**, 16, 70-81. (DOI: 10.1038/nmat4778)

30. J. Jia[†], L. C. Seitz[†], J. D. Benck[†], Y. Huo, Y. Chen, J. W. D. Ng, T. Bilir, J. S. Harris*, T. F. Jaramillo*, "Solar Water Splitting by PV-Electrolysis with a Solar-to-Hydrogen Efficiency Over 30%," *Nat. Commun.*, **2016**, 7, 13237. (DOI: 10.1038/ncomms13237)

31. L. C. Seitz, C. F. Dickens, K. Nishio, Y. Hikita, J. Montoya, A. Doyle, C. Kirk, A. Vojvodic, H. Y. Hwang, J. K. Nørskov, T. F. Jaramillo*, "A Highly Active and Stable $IrO_x/SrIrO_3$ Catalyst for the Oxygen Evolution Reaction," *Science*, **2016**, 353(6303), 1011-1014. (DOI: 10.1126/science.aaf5050)
32. P. Chakthranont, B. A. Pinaud, L. C. Seitz, A. J. Forman, T. F. Jaramillo*, "Improving the Photoelectrochemical Performance of Hematite by Employing a High Surface Area Scaffold and Engineering Solid-Solid Interfaces," *Adv. Mater. Interfaces*, **2016**, 3(7), 1500626. (DOI: 10.1002/admi.201500626)
33. Y. Hikita*, K. Nishio, L. C. Seitz, P. Chakthranont, T. Tachikawa, T. F. Jaramillo, H. Y. Hwang, "Band Edge Engineering of Oxide Photoanodes for Photoelectrochemical Water Splitting: Integration of Subsurface Dipoles with Atomic-Scale Control," *Adv. Energy Mater.*, **2016**, 6(7), 1502154. (DOI: 10.1002/aenm.201502154)
34. L. C. Seitz, D. Nordlund, A. Gallo, T. F. Jaramillo*, "Tuning the Composition and Activity of Cobalt Titanium Oxide Catalysts for the Oxygen Evolution Reaction," *Electrochim. Acta,* **2016**, 193, 240-245. (DOI: 10.1016/j.electacta.2016.01.200)
35. L. C. Seitz, T. J. P. Hersbach, D. Nordlund, T. F Jaramillo*, "Enhancement Effect of Noble Metals on Manganese Oxide for the Oxygen Evolution Reaction," *J. Phys. Chem. Lett.*, **2015**, 6, 4178-4183. (DOI: 10.1021/acs.jpclett.5b01928)
36. P. Chakthranont, L. C. Seitz, T. F. Jaramillo*, "Mapping Photoelectrochemical Current Distribution at Nanoscale Dimensions on Morphologically-Controlled $BiVO_4$," *J. Phys. Chem. Lett.,* **2015**, 6, 3702–3707. (DOI: 10.1021/acs.jpclett.5b01587)
37. K. L. Pickrahn, Y. Gorlin, L. C. Seitz, A. Garg, D. Nordlund, T. F. Jaramillo, S. F. Bent*, "Applications of ALD MnO to Electrochemical Water Splitting," *Phys. Chem. Chem. Phys.*, **2015**, 17, 14003-14011. (DOI: 10.1039/C5CP00843C)
38. L. C. Seitz, B. A. Pinaud, D. Nordlund, Y. Gorlin, T. F. Jaramillo*, "$CoTiO_x$ Catalysts for the Oxygen Evolution Reaction," *J. Electrochem. Soc.,* **2015**, 162(12), H841-H846. (DOI: 10.1149/2.0931510jes)
39. L. C. Seitz, Z. Chen, A. J. Forman, B. A. Pinaud, J. D. Benck, T. F. Jaramillo*, "Modeling Practical Performance Limits of Photoelectrochemical Water Splitting Based on the Current State of Materials Research," *ChemSusChem*, **2014**, 7, 1372-1385. (DOI: 10.1002/cssc.201301030)
40. Y. Gorlin, C-J Chung, J. D. Benck, D. Nordlund, L. C. Seitz, T-C Weng, D. Sokaras, B. M. Clemens, T. F. Jaramillo*, "Understanding Interactions between Manganese Oxide and Gold that Lead to Enhanced Activity for Electrocatalytic Water Oxidation," *J. Am. Chem. Soc.*, **2014**, 136, 4920-4926. (DOI: 10.1021/ja407581w)
41. B. A. Pinaud, J. D. Benck, L. C. Seitz, A. J. Forman, Z. Chen, T. G. Deutsch, B. D. James, K. N. Baum, G. N. Baum, S. Ardo, H. Wang, E. Miller, T. F. Jaramillo*, "Technical and Economic Feasibility of Centralized Facilities for Solar Hydrogen Production via Photocatalysis and Photoelectrochemistry," *Energy Environ. Sci.*, **2013**, 6, 1983-2002. (DOI: 10.1039/C3EE40831K)
42. L. Zhang, L. C. Seitz[%], A. M. Abramczyk[%], L. Liu, C. Chan*, "cAMP Initiates Early Phase Neuron-like Morphology Changes and Late Phase Neural Differentiation in Mesenchymal Stem Cells," *Cell Mol. Life Sci.*, **2011**, 68(5), 863-876. (DOI: 10.1007/s00018-010-0497-1)
43. L. Zhang, L. C. Seitz[%], A. M. Abramczyk[%], C. Chan*, "Synergistic Effect of cAMP and Palmitate in Promoting Altered Mitochondria Function and Cell Death in HepG2 Cells," *Exp. Cell Res.*, **2010**, 316(5), 716-727. (DOI: 10.1016/j.yexcr.2009.12.008)

## Invited External Presentations

**Department Seminars:**

- Iowa State University, Chemical and Biological Engineering, Ames, IA, 2024.
- McMaster University, Chemical Engineering, Hamilton, ON, Canada, 2024.
- University of Oklahoma, Sustainable Chemical, Biological, and Materials Engineering, Norman, OK, 2024.
- Princeton University, Chemical and Biological Engineering, Princeton, NJ, 2024.
- Virginia Tech, Chemical Engineering, Blacksburg, VA, 2024.
- University of Houston, Chemical and Biomolecular Engineering, Houston, TX, 2023.
- Brown University, Chemical Engineering, Providence, RI, 2022.
- Tufts University, Chemical Engineering, Medford, MA, 2021.
- City College of New York, Chemical Engineering, New York, NY, 2020.

**National Conferences:**

- ACS National Meeting, *Honorary Session: ACS CATL Early Career Award*, Denver, CO, 2024.
- ACS National Meeting, *Fundamentals of Catalysis and Surface Science*, Denver, CO, 2024.
- Gordon Research Conference, *Catalysis*, New London, NH, 2024.
- ACS National Meeting, *Role of Fundamental Interfacial Processes in Electrocatalysis*, New Orleans, LA, 2024.
- ACS National Meeting, *Fundamentals of Catalysis and Surface Science*, San Francisco, CA, 2023.
- AIChE Annual Meeting, *Tutorial Session on Electrochemical Methods*, Phoenix, AZ, 2022.
- AIChE Annual Meeting, **Keynote*, *Catalyst Design, Synthesis, and Characterization*, Phoenix, AZ, 2022.
- AIChE Annual Meeting, *Pioneers of Catalysis and Reaction Engineering*, Boston, MA, 2021.
- ACS National Meeting, *New Methods in Nanocatalyst Development*, Atlanta, GA, 2021.
- ACS National Meeting, *Sustainable Energy & Water*, San Diego, CA, 2019.

**Regional Conferences / User Meetings:**

- Argonne National Lab Advanced Photon Source Users' Meeting, Lemont, IL, 2024.
- 2023 SUNCAT Summer Institute, Stanford, CA, 2023.
- Michigan Catalysis Society, North American Catalysis Society, 2023.
- Catalysis Club of Chicago, North American Catalysis Society, 2022.
- ACS Central Regional Meeting, Midland, MI, 2019.
- Michigan State University, CHEMS Research Forum, East Lansing, MI, 2019.
- Stanford University, DARE Alumni Presentation, Stanford, CA, 2018

## Teaching

Assistant Professor: Northwestern University 2018 – *present*

[#] *course developed by Seitz*

- CHEMENG 408: Kinetics and Reactor Design (grad required course): F18,F19,F20,F21,F23,F24
- [#] CHEMENG 441: Electrocatalysis for Sustainable Fuels and Chemicals (undergrad / grad elective course): W19,W21,W23,F23
- DSGN 106: Design Thinking & Communication (undergraduate required course): W20,S21,S22

Searle Teaching Fellow: Northwestern University 2019 – 2020

- *"Clarifying the Critical Role of Diversity, Inclusion, and Active Learning in STEM Courses"*

## Memberships in Professional Societies

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|---|---|
| Electrochemical Society (ECS) | 2011 – 2013, 2023 – *present* |
| American Chemical Society (ACS) | 2019 – *present* |
| American Institute of Chemical Engineers (AIChE) | 2012 – *present* |
| Tau Beta Pi, Engineering Honor Society | 2009 – *present* |
| Society of Women Engineers (SWE) | 2006 – 2010 |

## Northwestern University Service and Activities

| | |
|---|---|
| Paula M. Trienens Institute for Sustainability and Energy: Pillar Co-Lead | 2024 – *present* |
| Paula M. Trienens Institute for Sustainability and Energy Faculty Affiliate | 2023 – *present* |
| Morning Mentor Faculty Advisor | 2023 – *present* |
| Science in Society Faculty Affiliate | 2023 – *present* |
| International Institute of Nanotechnology Faculty Affiliate | 2022 – *present* |
| Center for Catalysis and Surface Science Executive Committee | 2020 – *present* |
| ChBE Anti-Racism Diversity Equity & Inclusion Committee | 2020 – *present* |
| ChBE Department Seminar Coordinator | 2020 – 2022 |
| ChBE Undergraduate Committee | 2018 – *present* |
| ChBE Sustainability Committee | 2019 – 2021 |
| Data Science Initiative "Addressing Climate Change" Faculty Group Co-Leader | 2019 – 2021 |
| ChBE Faculty Search Committee | 2020 |

## External Service and Activities

Early Career Editorial Board (ECEB) of the *Journal of Catalysis* 2023 – *present*

AIChE Catalysis and Reaction Engineering (CRE) Division

- Division Director 2020 – 2023
- Diversity & Inclusion Task Force Vice Chair / Chair / Past Chair 2022 – *present*

Advisory Board, Michigan State University CHEMS Department 2018 – *present*

AIChE Fall National Meeting

- Session Co-founder and Co-organizer: Catalysis and Reaction Engineering Division
  "*Pioneers of Catalysis and Reaction Engineering*" 2021 – 2024
- Session Co-organizer: Fundamental Electrochemistry Division
  "*Electrochemical Advances to Enable Efficient Oxygen, Hydrogen, and Water Reactions*" 2023
- Symposia (Lead or Co-) Organizer: Catalysis and Reaction Engineering Division
  "*Electrocatalysis and Photocatalysis*" 2019 – 2021

ACS National Meeting

- Symposia Co-Organizer: Catalysis Science and Technology Division
  *"Electrocatalysis for Sustainable Energy and Biomass Conversion*" 2024
  "*Towards Clean Hydrogen: Challenges and Opportunities*" 2024
  "*Advances in $CO_2$ Electrocatalysis*" 2020, 2021
  "*Electrocatalysis for Energy Generation and Storage*" 2019

NACS North American Meeting (NAM26)

- Conference Organizing Committee (Poster Program Co-Chair) 2019