

Jordi Cabana

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EDUCATION

- 2000-2004** **Universitat Autònoma de Barcelona.** Barcelona, SPAIN.
Ph.D. in Materials Science.
- 1996-2000** **Universitat Autònoma de Barcelona.** Barcelona, SPAIN.
B.Sc. in Chemistry.

PROFESSIONAL EXPERIENCE

- 2017-Present** **Associate Professor.** Department of Chemistry, University of Illinois at Chicago, Chicago, IL (USA).
- 2013-2017** **Assistant Professor.** Department of Chemistry, University of Illinois at Chicago, Chicago, IL (USA).
- 2008-2013** **Chemist Research Scientist.** Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory, Berkeley, CA (USA).
- 2005-2008** **Post-Doctoral Research Fellow.** Department of Chemistry, Stony Brook University, Stony Brook, NY (USA).
- 2004-2005** **Post-Doctoral Research Associate.** Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Barcelona (Spain).

FELLOWSHIPS, AWARDS AND HONORS

- 2020** [Scialog Award](#), Advanced Energy Storage, Research Corporation For Science Advancement.
- 2018** [Scialog Award](#), Advanced Energy Storage, Research Corporation For Science Advancement.
- 2017-2020** [Scialog Fellow](#), Advanced Energy Storage, Research Corporation For Science Advancement.
- 2010** *Proxime Accessit* for the [Manuel Arroyo Award](#) for Alumni, Escola Sant Gervasi (Spain)
- 2006** Antoni de Martí i Franqués Award in Chemistry, Institut d'Estudis Catalans (Spain).
- 2006-2008** Beatriu de Pinós postdoctoral fellowship, Generalitat de Catalunya (Spain).
- 2000-2004** Predoctoral fellowship, Generalitat de Catalunya (Spain).

FUNDING SUPPORT

(Amounts indicate *only the share for Jordi Cabana*, unless otherwise stated)

- 2020-2023 Department of Defense: Educational and Research Training Collaborative: Workforce Development for National Defense (PI: Russell Hemley, UIC), **\$2,999,694** (grant to support undergraduate training).
- 2020-2023 National Science Foundation: Defining Critical Heterogeneity in Cathode Architectures for Li-ion Batteries with High Energy Density (PI: Jordi Cabana, UIC), **\$330,625**.
- 2020-2022 Research Corporation for Science Advancement: Solid Electrolytes with Dual Li- and F-ion Conductivity to Overcome the Tyranny of Gravimetric Capacity (PI: Jordi Cabana, UIC), **\$55,000**.
- 2018-2023 Department of Energy: Joint Center for Energy Storage Research - Synthesis and Characterization of New Cathode Host Structures (Director: George Crabtree, ANL/UIC), **\$714,082** (2018-2021 period only).
- 2018-2021 National Science Foundation: Chemical and Electronic States in Chalcogenide-based Electrocatalytic Systems During CO₂ Reduction (PI: Jordi Cabana, UIC), **\$225,000**.
- 2018-2021 National Science Foundation: Elucidation of Ligand-Centered Electrochemical Reactivity in Complex Transition Metal Oxides (PI: Jordi Cabana, UIC), **\$338,805**.
- 2018-2019 Research Corporation for Science Advancement: Defining Interfacial Reactivity in High Capacity Li-ion Cathode Materials (PI: Jordi Cabana, UIC), **\$33,334**.
- 2017-2020 National Science Foundation: MRI: Acquisition of a Multi-Reaction Mode Inductively Coupled Plasma-Mass Spectrometer for Metal Analysis in Environmental Media (PI: Kathryn Nagy, UIC), **\$209,947** (instrumentation award).
- 2017-2021 National Science Foundation: Next Generation Electrochemistry (NGenE) Summer Institute (PI: Jordi Cabana, UIC), **\$100,000** (grant to support organization of Summer workshop).
- 2016-2020 National Science Foundation: Battery Cathodes with Optimized Interfacial Stability through the Tailored Design of Core-Shell Architectures (PI: Jordi Cabana, UIC), **\$371,399**.
- 2016-2019 National Science Foundation: MRI: Acquisition of a Dual-EELS Gatan Quantum Imaging Spectrometer to Upgrade the JEOL ARM200CF at UIC (PI: Robert Klie, UIC), **\$209,947** (instrumentation award).
- 2014-2018 Army Research Laboratory: Crystal and Electronic Structure Stability of High Voltage LiCoPO₄-Based Electrodes (PI: Jordi Cabana, UIC), **\$267,715**.
- 2014-2019 Department of Energy: Northeast Center for Chemical Energy Storage - High Resolution Chemical Imaging of Electrode Processes (Director: M. Stanley Whittingham, Binghamton University), **\$610,000**.
- 2013-2019 Department of Energy: Joint Center for Energy Storage Research - Synthesis and Characterization of New Cathode Host Structures (Director: George Crabtree, ANL/UIC), **\$1,521,037**.

PUBLICATIONS

Journals included in the SCI (“*” = corresponding author; “#” = undergraduate researcher)

- [1] L. Majidi, A. Ahmadiparidari, N. Shan, S. N. Misal, K. Kumar, Z. Huang, S. Rastegar, Z. Hemmat, X. Zou, P. Zapol, J. Cabana, L. A. Curtiss* and A. Salehi-Khojin*. *2D copper tetrahydroxyquinone conductive metal–organic framework for selective CO₂ electrocatalysis at low overpotentials*, Adv. Mater. **2021**, *33*, 2004393.
- [2] Q. Wang, S. Mariyappan, G. Rousse, A. V. Morozov, B. Porcheron, R. Dedryvère, J. Wu, W. Yang, L. Zhang, M. Chakir, M. Avdeev, M. Deschamps, Y.-S. Yu, J. Cabana, M.-L. Doublet, A. M. Abakumov and J.-M. Tarascon*. *Unlocking anionic redox activity in O3-type sodium 3d layered oxides via Li substitution*, Nat. Mater. **2021**, In press.
- [3] X. Cao, H. Li, Y. Qiao*, M. Jia, X. Li, J. Cabana and H. Zhou*. *Stabilizing anionic redox chemistry in a Mn-based layered oxide cathode constructed by Li-deficient pristine state*, Adv. Mater. **2021**, *33*, 2004280.
- [4] H. Li, A. J. Perez, B. Taudul, T. D. Boyko, J. W. Freeland, M. L. Doublet, J.-M. Tarascon and J. Cabana*. *Elucidation of active oxygen sites upon delithiation of Li₃IrO₄*, ACS Energy Lett. **2021**, *6*, 140-147.
- [5] S. T. Plunkett, H. H. Wang, S. H. Park, Y. J. Lee, J. Cabana, K. Amine, S. Al-Hallaj, B. P. Chaplin* and L. A. Curtiss*. *Charge transport properties of lithium superoxide in Li-O₂ batteries*, ACS Appl. Energy Mater. **2020**, *3*, 12575-12583.
- [6] I. D. Johnson, G. Nolis, L. Yin, H. D. Yoo, P. Parajuli, A. Mukherjee, J. L. Andrews, M. Lopez, R. F. Klie, S. Banerjee, B. J. Ingram, S. Lapidus, J. Cabana* and J. A. Darr*. *Enhanced charge storage of nanometric ζ-V₂O₅ in Mg electrolytes*, Nanoscale **2020**, *12*, 22150-22160.
- [7] M. Lopez#, H. D. Yoo, L. Hu, J. L. Andrews, S. Banerjee and J. Cabana*. *Does water enhance Mg intercalation in oxides? The case of a tunnel framework*, ACS Energy Lett. **2020**, *5*, 3357-3361.
- [8] S. Wang, J. Cavin, Z. Hemmat, K. Kumar, A. Ruckel, L. Majidi, H. Gholivand, R. Dawood, J. Cabana, N. Guisinger, R. F. Klie, F. Khalili-Araghi, R. Mishra* and A. Salehi-Khojin*. *Phase-dependent band gap engineering in alloys of metal-semiconductor transition metal dichalcogenides*, Adv. Funct. Mater. **2020**, *30*, 2004912.
- [9] G. M. Nolis, J. M. Gallardo-Amores, J. Serrano-Sevillano, E. P. Jahrman, H. D. Yoo, L. Hu, J. C. Hancock, J. Bolotnikov, S. Kim, J. W. Freeland, Y.-S. Liu, K. R. Poeppelmeier, G. T. Seidler, J. Guo, M. Á Alario-Franco, M. Casas-Cabanas, E. Morán and J. Cabana*. *Factors defining the intercalation electrochemistry of CaFe₂O₄-type manganese oxides*, Chem. Mater. **2020**, *32*, 8203–8215.
- [10] M. Jia, H. Li, Y. Qiao*, L. Wang, X. Cao, J. Cabana, H. Zhou*. *Elucidating anionic redox chemistry in P3 layered cathode for Na-ion batteries*, ACS Appl. Mater. Interfaces **2020**, *12*, 38249–38255.
- [11] L. Yin, M. Murphy, K. Kim, L. Hu, J. Cabana, D. J. Siegel and S. H. Lapidus*. *Synthesis of antiperovskite solid electrolytes: Comparing Li₃SI, Na₃SI, and Ag₃SI*, Inorg. Chem. **2020**, *59*, 11244-11247.
- [12] L. Hu, J. R. Jokisaari, B. J. Kwon, L. Yin, S. Kim, H. Park, S. H. Lapidus, R. F. Klie, B. Key, P. Zapol, B. J. Ingram, J. T. Vaughey and J. Cabana*. *High capacity for Mg²⁺ deintercalation in spinel vanadium oxide nanocrystals*, ACS Energy Lett. **2020**, *5*, 2721-2727.
- [13] B. J. Kwon, L. Yin, H. Park, P. Parajuli, K. Kumar, S. Kim, M. Yang, M. Murphy, P. Zapol, C. Liao, T. T. Fister, R. F. Klie, J. Cabana, J. T. Vaughey, S. H. Lapidus and B. Key*. *High voltage Mg-ion battery cathode via a solid solution Cr–Mn spinel oxide*, Chem. Mater. **2020**, *32*, 6577-6587.

- [14] A. Kuhn*, M. R. Plews, J. C. Pérez-Flores, F. Fauth, M. Hoelzel, J. Cabana and F. García-Alvarado. *Redox chemistry and reversible structural changes in rhombohedral VO₂F cathode during Li intercalation*, Inorg. Chem. **2020**, 59, 10048-10058.
- [15] I. D. Johnson, G. Nolis, K. McColl, Y. A. Wu, D. Thornton, L. Hu, H. D. Yoo, J. W. Freeland, F. Corà, J. K. Cockcroft, I. P. Parkin, R. F. Klie, J. Cabana and J. A. Darr. *Probing Mg intercalation in the tetragonal tungsten bronze framework V₄Nb₁₈O₅₅*, Inorg. Chem. **2020**, 59, 9783-9797.
- [16] M. Wolfman, Y.-S. Yu, B. M. May, Z. W. Lebens-Higgins, S. Sallis, N. V. Faenza, N. Pereira, N. Shirato, V. Rose, D. A. Shapiro, G. G. Amatucci, L. F. J. Piper and Jordi Cabana*. *Mapping competitive reduction upon charging in LiNi_{0.8}Co_{0.15}Al_{0.05}O₂ primary particles*, Chem. Mater. **2020**, 32, 6161-6175.
- [17] B. J. Kwon, C. Kim, J. R. Jokisaari, H. D. Yoo, S.-D. Han, S. Kim, K.-C. Lau, C. Liao, Y.-S. Liu, J. Guo, B. Key, R. F. Klie, J. Cabana*. *Intercalation of Mg into a few-layer phyllomanganate in nonaqueous electrolytes at room temperature*, Chem. Mater. **2020**, 32, 6014-6025.
- [18] H. Li, S. Ramakrishnan, J. W. Freeland, B. D. McCloskey and J. Cabana*. *Definition of redox centers in reactions of lithium intercalation in Li₃RuO₄ polymorphs*, J. Am. Chem. Soc. **2020**, 142, 8160-8173.
- [19] J. G. Lapping, O. J. Borkiewicz, K. M. Wiaderek, J. L. Allen, T. R. Jow and J. Cabana*. *Structural changes and reversibility upon deintercalation of Li from LiCoPO₄ derivatives*, ACS Appl. Mater. Interfaces **2020**, 12, 20570-20578.
- [20] Z. Hemmat, J. Cavin, A. Ahmadiparidari, A. Ruckel, S. Rastegar, S. N. Misal, L. Majidi, K. Kumar, S. Wang, J. Guo, R. Dawood, F. Lagunas, P. Parajuli, A. T. Ngo, L. A. Curtiss, S. B. Cho, J. Cabana, R. F. Klie, R. Mishra*, A. Salehi-Khojin*. *Quasi-binary transition metal dichalcogenide alloys: Thermodynamic stability prediction, scalable synthesis and application*, Adv. Mater. **2020**, 32, 1907041.
- [21] L. Hu*, F. Hassan#, L. Yin and J. Cabana. *Spinel-layered Li_{1.1}[Mn_{0.6}Co_{0.8}Ni_{0.6}]O_{4-δ} nanocrystals: Synthesis and electrochemistry at high potentials*, J. Solid State Chem. **2020**, 288, 121365.
- [22] M. L. Nisbet, I. M. Pendleton, G. M. Nolis, K. J. Griffith, J. Schrier, J. Cabana, A. J. Norquist and K. R. Poeppelmeier*. *Machine-learning-assisted synthesis of polar racemates*, J. Am. Chem. Soc. **2020**, 142, 7555-7566.
- [23] R. Zhang, P. E. Pearce, V. Pimenta, J. Cabana, H. Li, D. Alves Dalla Corte, A. M. Abakumov, G. Rousse, D. Giaume, M. Deschamps and A. Grimaud. *First example of protonation of Ruddlesden-Popper Sr₂IrO₄: a route to enhanced water oxidation catalysts*, Chem. Mater. **2020**, 32, 3499-3509.
- [24] L. Majidi, Z. Hemmat, R. E. Warburton, K. Kumar, A. Ahmadiparidari, L. Hong, J. Guo, P. Zapol, R. F. Klie, J. Cabana, J. Greeley, L. A. Curtiss* and A. Salehi-Khojin*. *Highly active rhenium-, ruthenium-, and iridium-based dichalcogenide electrocatalysts for oxygen reduction and oxygen evolution reactions in aprotic media*, Chem. Mater. **2020**, 32, 2764-2773.
- [25] H. Kim, W. Choi, J. Yoon, J. H. Um, W. Lee, J. Kim, J. Cabana and W.-S. Yoon*. *Exploring anomalous charge storage in anode materials for next-generation Li rechargeable batteries*, Chem. Rev. **2020**, 120, 6934-6976.
- [26] X. Cao, H. Li, Y. Qiao, X. Li, M. Jia, J. Cabana and H. Zhou*. *Stabilizing reversible oxygen redox chemistry in layered oxides for sodium-ion batteries*, Adv. Energy Mater. **2020**, 10, 1903785.
- [27] C. Zhao, Z. Yao, Q. Wang, H. Li, J. Wang, M. Liu, S. Ganapathy, Y. Lu, J. Cabana, B. Li, X. Bai, A. Aspuru-Guzik, M. Wagemaker*, L. Chen and Y.-S. Hu*. *Revealing high Na-content P2-type layered oxides as advanced sodium-ion cathodes*, J. Am. Chem. Soc. **2020**, 142, 5742-5750.
- [28] T. de Boer*, J. G. Lapping, J. A. Read, T. T. Fister, M. Balasubramanian, J. Cabana* and A. Moewes. *Direct evidence of charge transfer upon anion intercalation in graphite cathodes through new electronic states: An experimental and theoretical study of hexafluorophosphate*, Chem. Mater. **2020**, 32, 2036-2043.

- [29] M. Wolfman, S. Khawaja[#] and J. Cabana*. *Mapping and metastability of heterogeneity in LiMn₂O₄ battery electrodes with high energy density*, J. Electrochem. Soc. **2020**, 167, 020526.
- [30] B. J. Kwon, F. Dogan, J. R. Jokisaari, B. Key, I. L. Bolotin, T. Paulauskas, C. Kim, R. F. Klie and J. Cabana*. *Synthesis and characterization of core-shell nanocrystals of Co-rich cathodes*, J. Electrochem. Soc. **2020**, 167, 050501.
- [31] B. J. Kwon, K. C. Lau, H. Park, Y. A. Wu, K. L. Hawthorne, H. Li, S. Kim, I. L. Bolotin, T. T. Fister, P. Zapol, R. F. Klie, J. Cabana, C. Liao, S. H. Lapidus, B. Key and J. T. Vaughey*. *Probing electrochemical Mg-ion activity in MgCr_{2-x}V_xO₄ spinel oxides*, Chem. Mater. **2020**, 32, 1162-1171.
- [32] R. D. Bayliss, B. Key, G. Sai Gautam, P. Canepa, B. J. Kwon, S. H. Lapidus, F. Dogan, A. A. Adil[#], A. S. Lipton, P. J. Baker, G. Ceder, J. T. Vaughey and J. Cabana*. *Probing Mg migration in spinel oxides*. Chem. Mater. **2020**, 32, 663-670.
- [33] S. Saha, G. Assat, M. T. Sougrati, D. Foix, H. Li, J. Vergnet, S. Turi, Y. Ha, W. Yang, J. Cabana, G. Rousse, A. M. Abakumov and J.-M. Tarascon*. *Exploring the bottlenecks of anionic redox in Li-rich layered sulfides*, Nat. Energy **2019**, 4, 977-987.
- [34] H. Zhang, B. M. May, F. Omenya, M. S. Whittingham, J. Cabana and G. Zhou*. *Layered oxide cathodes for Li-ion batteries: Oxygen loss and vacancy evolution*, Chem. Mater. **2019**, 31, 7790-7798.
- [35] Q. Jacquet, A. Iadecola, M. Saubanère, H. Li, E. J. Berg, G. Rousse, J. Cabana, M.-L. Doublet and J.-M. Tarascon*. *Charge transfer band gap as an indicator of hysteresis in Li-disordered rock salt cathodes for Li-ion batteries*, J. Am. Chem. Soc. **2019**, 141, 11452-11464.
- [36] H. D. Yoo, J. R. Jokisaari, Y.-S. Yu, B. J. Kwon, L. Hu, S. Kim, S.-D. Han, M. Lopez[#], S. H. Lapidus, G. M. Nolis, B. J. Ingram, I. Bolotin, S. Ahmed, R. F. Klie, J. T. Vaughey, T. T. Fister, and J. Cabana*. *Intercalation of magnesium into a layered vanadium oxide with high capacity*, ACS Energy Lett. **2019**, 4, 1528-1534.
- [37] L. Li*, F. C. Castro, J. S. Park, H. Li, E. Lee, T. Boyko, J. W. Freeland, Z. Yao, T. T. Fister, J. Vinson, E. L. Shirley, C. Wolverton, J. Cabana, V. P. Dravid, M. M. Thackeray and M. K. Y. Chan*. *Probing electrochemically-induced structural evolution and oxygen redox reactions in layered lithium iridate*, Chem. Mater. **2019**, 31, 4341-4352.
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- [39] B. J. Kwon, F. Dogan, J. R. Jokisaari, B. Key, C. Kim, Y.-S. Liu, J. Guo, R. F. Klie and J. Cabana*. *Effect of passivating shells on the chemistry and electrode properties of LiMn₂O₄ nanocrystal heterostructures*, ACS Appl. Mater. Interfaces **2019**, 11, 3823-3833.
- [40] L. Esmezjan*, D. Mikhailova, M. Etter, J. Cabana, C. P. Grey, S. Indris* and H. Ehrenberg. *Electrochemical lithium extraction and insertion process of sol-gel synthesized LiMnPO₄ via two-phase mechanism*, J. Electrochem. Soc. **2019**, 166, A1257-A1265.
- [41] U. Boesenberg*, D. Sokaras, D. Nordlund, T. C. Weng, E. Gorelov, T. J. Richardson, R. Kostecki and J. Cabana*. *Electronic structure changes upon lithium intercalation into graphite – Insights from ex situ and operando X-ray Raman spectroscopy*, Carbon **2019**, 143, 371-377.
- [42] L. Hu, I. D. Johnson, S. Kim, G. M. Nolis, J. W. Freeland, H. D. Yoo, T. T. Fister, L. McCafferty, T. E. Ashton, J. A. Darr* and J. Cabana*. *Tailoring the electrochemical activity of magnesium chromium oxide towards Mg batteries through control of size and crystal structure*, Nanoscale **2019**, 11, 639-646.
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- [46] G. M. Nolis, J. M. Bolotnikov# and J. Cabana*. *Control of size and composition of colloidal nanocrystals of manganese oxide*, Inorg. Chem. **2018**, 57, 12900–12907.
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- [56] H. Zhang, B. M. May, J. Serrano-Sevillano, M. Casas-Cabanas, J. Cabana, C. Wang* and G. Zhou*. *Facet-dependent rock-salt reconstruction on the surface of layered oxide cathodes*, Chem. Mater. **2018**, 30, 692–699.
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- [4] J. Cabana, G. Rousse and M.R. Palacín. *Lithium manganese nitride and oxynitride: alternative electrode materials for lithium batteries*, in "New Trends in Intercalation Compounds for Energy Storage and Conversion", edited by C. Julien, K. Zaghib and J. Prakash, Paris, **2003**. PV2003-20, The Electrochemical Society Proceeding Series, 139-146.
- [5]

THESES SUPERVISED

- [1] "*Insights into Ligand-centered Redox Mechanisms in Li-rich Metal Oxides during Battery Reactions*", Haifeng Li, UIC, September 29th, 2020.

- [2] *“Insights into Electrochemical Reactions in High Voltage Electrode Materials for Li Ion Batteries”*, Jacob G. Lapping, UIC, July 19th, 2019.
- [3] *“Understanding Divalent Cation Intercalation in Manganese Oxides”*, Gene M. Nolis, UIC, July 18th, 2019.
- [4] *“Chemical and Structural Mapping of Cathodes for Li-Ion Batteries From the Nano- to the Electrode-Scale”*, Mark Wolfman, UIC, July 15th, 2019.
- [5] *“Probing Phase Transformations in Lithium Ion Cathode Materials Using X-ray Imaging”*, Bryan M. May, UIC, May 29th, 2018.
- [6] *“Fluorine Containing Solids: Synthesis, Bonding and Electrochemical Properties”*, Michael R. Plews, UIC, May 25th, 2018.
- [7] *“Synthesis of Nanocrystal Heterostructures for Li-ion Battery Cathode with Increased Interfacial Stability”*, Bob Jin Kwon, UIC, April 18th, 2018.

PATENTS

- **Product $\text{Li}_x\text{MnN}_{5-y}\text{O}_y$, its obtaining and use as electrode material in rechargeable lithium batteries.** M. R. Palacín, J. Cabana, A. Fuertes. Spain, Appl. No. 200201414. PCT application ES03/00249.
- **Anode materials based on sodium nonatitanate for dual intercalation.** M. Shirpour, J. Cabana, M. M. Doeff. U.S. Patent Application 61/775,172.

CONTRIBUTIONS TO SCIENTIFIC MEETINGS AND SEMINARS

Invited talks

- [1] *Current status and bottlenecks of the intercalation of Mg into spinel oxides.* Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME) 2020. Honolulu, HI (USA), October 4th-9th, 2020.
- [2] *Understanding interfacial reactivity in Li-ion battery cathodes and the effect of surface modifications.* 236th ECS Meeting. Atlanta, GA (USA), October 13th-17th, 2019.
- [3] *Understanding interfacial reactivity in Li-ion battery cathodes and the effect of surface modifications.* Electrochemical Energy Storage Seminar, National Renewable Energy Laboratory. Golden, CO (USA), June 28th, 2019.
- [4] *Measuring and defining electrochemical reactions of transition metal oxides in Mg electrolytes.* Beyond Li-ion XII. Golden, CO (USA), June 25th-27th, 2019.
- [5] *Advances in X-ray microscopy for the study of battery reactions in single particles.* 2019 MRS Spring Meeting & Exhibit. Phoenix, AZ (USA), April 21st-26th, 2019.
- [6] *Measuring and defining electrochemical reactions of transition metal oxides in Mg electrolytes.* 2019 MRS Spring Meeting & Exhibit. Phoenix, AZ (USA), April 21st-26th, 2019.
- [7] *What happens inside batteries? A close-up look.* Department of Chemistry, Illinois State University. Bloomington, IL (USA), April 12th, 2019.
- [8] *Advances in X-ray microscopy for the study of battery reactions in single particles.* Pittcon 2019. Philadelphia, PA (USA), March 17th-21st, 2019.
- [9] *Measuring and defining electrochemical reactions of transition metal oxides in Mg electrolytes.* International Battery Association Meeting: IBA2019. La Jolla, CA (USA), March 3rd-8th, 2019.
- [10] *Spectroscopic study of charge compensation in Li_3MO_4 (M=Ru, Ir) during electrochemical cycling.* 43rd International Conference and Expo on Advanced Ceramics and Composites. Daytona Beach, FL (USA), January 27th-February 1st, 2019.
- [11] *Multiscale heterogeneity in single particles of Li-ion battery cathodes visualized with X-ray imaging.* 2018 MRS Fall Meeting. Boston, MA (USA), November 25th-30th, 2018.

- [12] *Chemical phenomena at interfaces between battery cathodes and electrolytes.* AiMES 2018, Cancún (Mexico), September 30th– October 4th, 2018.
- [13] *What happens inside batteries? Advances in X-ray imaging for the study of reactions in single particles.* Institut de Ciència de Materials de Barcelona (ICMAB-CSIC), Barcelona (Spain), July 14th, 2018.
- [14] *What happens inside batteries? A close-up look.* Department of Physics, Valparaiso University. Valparaiso, IN (USA), April 13th, 2018.
- [15] *Can Mg²⁺ be intercalated into crystalline oxides? An update.* 255th American Chemical Society Meeting. San Francisco, CA (USA), March 18th-22nd, 2018.
- [16] *Understanding and design of core-shell architectures for battery electrodes based on complex oxides.* Department of Mechanical, Materials, and Aerospace Engineering, Illinois Institute of Technology. Chicago, IL (USA), September 13th, 2017.
- [17] *What happens inside batteries? A close-up look.* Department of Chemistry, Lewis University. Romeville, IL (USA), April 28th, 2017.
- [18] *Advances in X-ray microscopy for the study of battery reactions in single particles.* APS Colloquium-Early Career Researcher Series. Argonne National Laboratory, Lemont, IL (USA), July 12th, 2017.
- [19] *Are spinel oxides viable for the reversible intercalation of divalent ions? An update.* 2017 MRS Spring Meeting & Exhibit. Phoenix, AZ (USA), April 17th-21st, 2017.
- [20] *Tale of spinels: From Li-ion to Mg battery electrodes.* 253rd American Chemical Society Meeting. San Francisco, CA (USA), April 2nd-6th, 2017.
- [21] *Understanding and design of core-shell architectures for battery electrodes based on complex oxides.* 253rd American Chemical Society Meeting. San Francisco, CA (USA), April 2nd-6th, 2017.
- [22] *Stabilization of battery electrode-electrolyte interfaces employing nanocrystals with passivating epitaxial shells.* 41st International Conference and Expo on Advanced Ceramics and Composites. Daytona Beach, FL (USA), January 22nd-27th, 2017.
- [23] *Oxides with a spinel structure: Case studies of the existence of multiscale phenomena in battery electrodes.* Department of Materials Science and NanoEngineering, Rice University. Houston, TX (USA), October 13th, 2016.
- [24] *Visualization of electrochemical reactions in battery materials with X-ray microscopy.* International Meeting on Lithium Batteries (IMLB) 2016. Chicago, IL (USA), June 19th-24th, 2016.
- [25] *Visualization of battery reactions using X-ray microscopy.* 11th U.S.-China Electric Vehicle and Battery Technology Meeting. Denver, CO (USA), April 25th-27th, 2016.
- [26] *Characterization of multivalent electrochemical reactions in spinel oxide hosts.* 251st ACS National Meeting & Exposition. San Diego, CA (USA), March 13th-17th, 2016.
- [27] *Visualization of electrochemical reactions in battery materials with X-ray microscopy.* Materials Science Division, Argonne National Laboratory. Lemont, IL (USA), February 18th, 2016.
- [28] *Developments in chemical imaging of battery reactions.* Department of Chemistry, University of Illinois at Urbana-Champaign. Urbana, IL (USA), February 5th, 2016.
- [29] *Avenues for research in battery electrode materials.* UIC/JCESR Workshop on Advanced Batteries Research. University of Illinois at Chicago. Chicago, IL (USA), October 15th-16th, 2015.
- [30] *Chemical imaging of battery processes: What can next generation tools contribute?* 2015 Advanced Light Source Users' Meeting. Lawrence Berkeley National Laboratory. Berkeley, CA (USA), October 5th-7th, 2015.
- [31] *Insight into multivalent electrochemistry provided by core level spectroscopy.* 2015 Advanced Light Source Users' Meeting. Lawrence Berkeley National Laboratory. Berkeley, CA (USA), October 5th-7th, 2015.

- [32] *A tale of spinels: from Li-ion to Mg battery electrodes*. 227th ECS Meeting. Chicago, IL (USA), May 24th-28th, 2015.
- [33] *Where have all the ions and electrons gone? The case for observations of heterogeneity as descriptors of function*. APS-U Workshop on Frontiers of Condensed Matter Physics. Argonne National Lab. Argonne, IL (USA), May 20th-21st, 2015.
- [34] *Multi-faceted characterization of battery reactions: the case of spinel hosts for Mg-ion batteries*. APS March Meeting 2015. San Antonio, TX (USA), March 2nd-6th, 2015.
- [35] *Visualization of electrochemical phase transformations in battery materials with synchrotron X-ray techniques*. Department of Chemistry, University of Wisconsin-Madison. Madison, WI (USA), February 12th, 2015.
- [36] *Electrochemical conversions as mechanisms of energy storage: Insight from the atomic to the microscopic scale*. 2014 MRS Fall Meeting. Boston, MA (USA), November 30th-December 5th, 2014.
- [37] *Multiscale phase transformations in battery electrodes: visualization and consequences*. Department of Chemical Engineering, University of Illinois at Chicago. Chicago, IL (USA), October 30th, 2014.
- [38] *Visualization of phase transformations at multiple length scales using X-rays*. 2014 Gordon Research Conference on Batteries. Ventura, CA (USA), March 9th-14th, 2014.
- [39] *Phase transformations determine the electrochemical properties of nanomaterials*. TMS 2014, 143rd Annual Meeting and Exhibition. San Diego, CA (USA), February 16th-20th, 2014.
- [40] *Conversion reactions for Li-ion batteries: Critical issues and chemical understanding*. 245th ACS National Meeting & Exposition. New Orleans, LA (USA), April 7th-11th, 2013.
- [41] *High resolution chemical imaging of phase transformations during electrochemical reactions*. 2013 MRS Spring Meeting. San Francisco, CA (USA), April 1st-5th, 2013.
- [42] *Study of the factors that enable carbon-free insulating Li-ion battery electrodes*. International Battery Association Meeting: IBA2013. Barcelona (Spain), March 10th-15th, 2013.
- [43] *Multiscale phase transformations in battery electrodes: visualization and consequences*. ALS-CXRO Seminar. Lawrence Berkeley National Laboratory, Berkeley, CA (USA), February 27th, 2013.
- [44] *Protective layers for the lithium electrode based on ceramic phases*. Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME) 2012. Honolulu, HI (USA), October 7th-12th, 2012.
- [45] *High resolution chemical imaging of phase transformations during intercalation reactions*. Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME) 2012. Honolulu, HI (USA), October 7th-12th, 2012.
- [46] *Protective layers for the lithium electrode based on ceramic phases*. Beyond Lithium Ion V-Symposium on Scalable Energy Storage. Berkeley, CA (USA), June 5th-7th, 2012.
- [47] *Multiscale reactions in battery electrodes: importance and methods of characterization*. Symposium on "Challenges and Opportunities in Energy Storage Materials". Providence, RI (USA), June 1st, 2012.
- [48] *Multiscale reactions in battery electrodes: importance and methods of characterization*. Young Engineers + Scientists Symposium (YESS) 2012. Berkeley, CA (USA), March 20th-22th, 2012.
- [49] *Identification of critical parameters in electrochemical intercalation reactions*. International Battery Association — Pacific Power Source Symposium (IBA-PPSS). Waikoloa, HI (USA), January 9th-13th, 2012.
- [50] *Insights into chemical reactions in Li-ion battery electrodes using synchrotron radiation techniques*. 2011 Advanced Light Source Users' Meeting. Lawrence Berkeley National Laboratory, October 3rd-5th, 2011.

- [51] *Understanding how Li-ion Batteries Operate Using in and ex-situ Synchrotron-based Techniques*. 2010 LCLS / SSRL Annual Users' Meeting. SLAC National Accelerator Laboratory, October 17th-21st, 2010.
- [52] *Spectroscopic and imaging study of high capacity Li-ion battery electrodes based on conversion reactions*. 2010 Advanced Light Source Users' Meeting. Lawrence Berkeley National Laboratory, October 13th-15th, 2010.
- [53] *Toward High Energy Density Li-ion Batteries. Understanding the Key Parameters for Performing Electrode Materials*. 2010 Molecular Foundry (TMF) and National Center for Electron Microscopy Users' Meeting. Lawrence Berkeley National Laboratory, September 30th-October 1st, 2010.
- [54] *Characterization of the local structure of positive electrode materials for Li-ion batteries*. CNDA summer 2008 conference on Complex and nanostructured materials for energy applications. Michigan State University, June 22nd-June 26th, 2008.

Other contributions (presenter only)

- [1] Pacific Rim Meeting on Electrochemical and Solid State Science (PRiME) 2012. Honolulu, HI (USA), October 7th-12th, 2012. 2 Oral Presentations.
- [2] 220th Meeting of The Electrochemical Society. Boston, MA (USA), October 9th-14th, 2011. 2 Oral Presentations.
- [3] 2010 MRS Fall Meeting. Boston, MA (USA), November 29th-December 2nd, 2010. 2 Oral Presentations, 1 Poster.
- [4] 212th Meeting of The Electrochemical Society. Washington, DC (USA), October 7th-12th, 2007. 2 Oral Presentations, 1 Poster.
- [5] QIES '06: 12th Spanish Meeting on Inorganic Chemistry, 6th Spanish Meeting on Solid State Chemistry. Barcelona (Spain), September 10th-14th, 2006. 1 Oral Presentation.
- [6] 2006 Gordon Research Conference on Solid State Chemistry I. New London, NH (USA), July 23rd-28th, 2006. 1 Poster.
- [7] QIES '04: 11th Spanish Meeting on Inorganic Chemistry, 5th Spanish Meeting on Solid State Chemistry. Santiago de Compostela (Spain), September 12th-16th, 2004. 1 Poster.
- [8] IIIrd French-Spanish Meeting on Solid State Chemistry and Physics. Montpellier (France), March 30th-April 2nd, 2004. 1 Poster.
- [9] XXIVth Meeting of the Electrochemistry Group of the Royal Spanish Society of Chemistry. Barcelona (Spain), June 25th-27th, 2002. 1 Oral Presentation.

MEMBERSHIPS AND SERVICE

- **Director**, [Next Generation Electrochemistry](#), 2016-present.
- **Member**, The Electrochemical Society, 2003-present.
- **Member**, The American Chemical Society, 2009-present.
- **Member**, Materials Research Society, 2010-present.
- **Panelist and Writer**, Basic Research Needs for Innovation and Discovery of Transformative Experimental Tools, organized by the U.S. Department of Energy (DOE), June 1-3, 2016.
- **Panelist**, Basic Research Needs for Electrical Energy Storage, organized by the U.S. Department of Energy (DOE), March 27-29, 2017.
- **Peer-reviewer**, Nature, Nature Materials, Journal of the American Chemical Society, Chemistry of Materials, Advanced Materials, Advanced Energy Materials, ACS Nano, among others.
- **Peer-reviewer and Panelist**, National Science Foundation (NSF).

- **Peer-reviewer**, U.S. Department of Energy (DOE).
- **Peer-reviewer**, Natural Sciences and Engineering Research Council of Canada (NSERC).
- **Vice-chair**, ECS Chicago Section, 2015-present.
- **Member**, Stanford Synchrotron Radiation Lightsource (SSRL) Users' Executive Committee (UEC), 2012-2015.
- **Editorial Board Member**, Scientific Reports, 2013-2018.
- **Editor**, 2013 MRS Spring Meeting Proceedings, Symposium G: *“Electrochemical Interfaces for Energy Storage and Conversion—Fundamental Insights from Experiments and Computations”*.
- **Symposium Organizer**, *“Symposium N: Research Frontiers on Electrochemical Energy Storage Materials— Design, Synthesis, Characterization and Modeling”*, 2014 MRS Spring Meeting.
- **Symposium Organizer**, *“Frontiers in Electrochemistry”*, 2019 ACS Great Lakes Regional Meeting.