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## Education

**1983**            **PhD, Inorganic Chemistry**, Brown University, Providence RI  
**1978**            **BA, Chemistry**, Swarthmore College, Swarthmore, PA

## Experience

**2019-present**    **Deputy Division Director, Energy Storage and Distributed Resources Division**, Lawrence Berkeley National Laboratory, Berkeley, CA

**2018-present**    **Senior Scientist**, Lawrence Berkeley National Laboratory, Berkeley, CA

Principal investigator in battery programs funded by the Department of Energy. Work is directed towards development of materials of possible utility in Li ion, metallic lithium, and sodium ion batteries. Responsibilities include supervision of several students and postdoctoral associates on the projects, communication of results via reports, scientific papers and presentations at conferences, and proposal writing.

**1990-2018**      **Staff Scientist**, Lawrence Berkeley National Laboratory, Berkeley, CA

**1986-1989**      **Senior Member, Technical Staff**, Computer Sciences Corporation, San Diego, CA.

Research performed at the Naval Ocean Systems Center involved synthesis, characterization, and testing of low surface tension fluorocarbons and polymers and organometallic compounds for anti-fouling applications. Responsibilities included supervision of two chemists on the project and the writing of proposals and technical papers on this topic and related work.

**1985-1986**      **Postdoctoral Chemist**, Lawrence Berkeley Laboratory, Berkeley, CA.

Research with Professor Robert Connick was directed towards understanding the mechanism of the oxidation of bisulfite.

**1983-1985**      **Postdoctoral Chemist**, University of California at Santa Barbara, Santa Barbara, CA.

Research with Professors Ralph G. Pearson and Paul Barrett concerned the matrix isolation of iron complexes of catalytic interest.

### Selected Recent Publications

1. "Optimization of Nonatitanate Electrodes for Sodium-ion Batteries" J. Alvarado, G. Barim, C. D. Quilty, E. Yi, K. J. Takeuchi, E.S. Takeuchi, A. C. Marschilok, and M. M. Doeff, **J. Mater. Chem. A** DOI:10.1039/D0TA07561B (2020).
2. "All-Solid-State Batteries Using Rationally Designed Garnet Electrolyte Frameworks" E. Yi, H. Shen, S. Heywood, J. Alvarado, D. Parkinson, G. Chen, S. W. Sofie, and M. M. Doeff **ACS Applied Energy Materials**, DOI: 10.1021/acsaem.9b02101 (2020).
3. "Distinct Surface and Bulk Thermal Behaviors of  $\text{LiNi}_{0.6}\text{Mn}_{0.2}\text{Co}_{0.2}\text{O}_2$  Cathode Materials as a Function of State-of-Charge" C. Tian, Y. Xu, W. H. Kan, D. Sokaras, D. Nordlund, H. Shen, K. Chen, Y. Liu, and M. Doeff **ACS Appl. Mater. & Interfaces**, DOI: 10.1021/acsami.9b21288 (2020).
4. "Thermal Stress-Induced Charge and Structure Heterogeneity in Emerging Cathode Materials" J. Alvarado, C. Wei, D. Nordlund, T. Kroll, D. Sokaras, Y. Tian, Y. Liu, and M. M. Doeff, **Mater. Today**, <https://doi.org/10.1016/j.mattod.2019.11.009> (2019).
5. "Oriented Porous LLZO 3D Structures Obtained by Freeze Casting for Battery Applications" H. Shen, E. Yi, M. Amores, L. Cheng, N. Tamura, D. Parkinson, G. Chen, K. Chen, and M. M. Doeff, **J. Mater. Chem. A**, DOI: 10.1039/C9TA06520B (2019).
6. "Scalable Freeze Tape Casting Fabrication and Pore Structure Analysis of 3D LLZO Solid-State Electrolytes" H. Shen, E. Yi, S. Heywood, D. Parkinson, G. Chen, N. Tamura, S. Sofie, K. Chen, and M. M. Doeff, **ACS Appl. Mater. & Interfaces**, DOI: 10.1021/acsami.9b11780 (2019).
7. "Three-Dimensionally Aligned Sulfur Electrodes by Directional Freeze Tape Casting" Y. Hwa, E. Yi, H. Shen, Y. Sung, J. Kou, K. Chen, D. Parkinson, M. Doeff, and E. Cairns, **Nano Letters**, DOI: [10.1021/acs.nanolett.9b01805](https://doi.org/10.1021/acs.nanolett.9b01805) (2019).
8. "Solid State Electrolyte Considerations for Electric Vehicle Batteries" H. Shen, E. Yi, L. Cheng, M. Amores, G. Chen, S. Sofie and M. Doeff, **Sust. Energy & Fuels**, **3**, 1647 (2019).
9. "Thermally Driven Mesopore Formation and Oxygen Release in Delithiated NCA Cathode Particles" M. Besli, A. Shukla, C. Wei, M. Metzger, J. Alvarado, J. Boell, D. Nordlund, G. Schneider, S. Hellstrom, C. Johnston, J. Christensen, M. Doeff, Y. Liu, and S. Kuppen, **J. Mater. Chem. A**, DOI: 10.1039/c9ta01720h (2019).

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10. “Structural Degradation of Layered Cathode Materials in Lithium-Ion Batteries Induced by Ball Milling” T. J. Pan, J. Alvarado, J. Zhu, Y. Yue, H. L. Xin, D. Nordlund, F. Lin, and M. M. Doeff, **J. Electrochem. Soc.**, DOI: 10.1149/2.0091910jes (2019).

### **Recent Patents and Patent Applications**

1) “Solid State Batteries Using Architecturally Controlled Rigid and Soft Solid Electrolytes” Eongyu Yi, Marca M. Doeff, Guoying Chen, Stephen Sofie, U.S. Patent Applications Serial No. 62/936,737 Nov. 18, 2019.

### **Synergistic Activities**

Chair of the Battery Division, Electrochemical Society (2018-2020)  
Secretary of the Electrochemical Society (May 2020-2024)

### **Awards**

Elected Fellow of the Royal Society of Chemistry (August 26, 2016).

Elected Fellow of the Electrochemical Society (June 2, 2016).

R&D100 award (Mechanical/Materials category) for Solid Lithium Battery (October, 2020).