

# Jong K. Keum

**Neutron/X-Ray Scattering Scientist**  
**(Local Contact: CNMS/NSD X-Ray Labs, and**  
**ORNL SAXS for CNMS/NSD users)**

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## Education

- **State University of New York at Stony Brook.**  
**PhD in Chemistry**, Advisors: Prof. Benjamin S. Hsiao.  
Dissertation: "Probing Flow-Induced Crystallization Precursor Structures in Polyolefin Blend Melts by Means of Synchrotron X-Ray Scattering".
- **Hannam University, Daejeon, Republic of Korea.**  
**BS in Macromolecular Science.**

## Research Experiences

- **Center for Nanophase Materials Sciences, Oak Ridge National Laboratory**, 2/2024 – current.  
**R&D Staff**.
- **Neutron Scattering Division, Oak Ridge National Laboratory**, 1/2013 – 1/2024.  
**Neutron Scattering Scientist**.
- **Oak Ridge National Laboratory**, 8/2010 – 1/2013.  
**Post Doctorate**, Advisor: Dr. James F. Browning.
- **Case Western Reserve University** 1/2008 - 8/2010.  
**Post Doctorate**, Advisors: Prof. Anne Hiltner/Prof. Eric Baer/Prof. LaShanda Korley.

## Mentorship

- **Postdoctoral researchers (4):**
  - 1) **Dr. Yingdong Luo (2016-2018).**
  - 2) **Dr. Nuradhika Herath (2016).**
  - 3) **Dr. Alexandra Steffen (2016-2018).**
  - 4) **Dr. Zach Liu (2022).**
- **PhD students (3):**
  - 1) **Dr. Sanjib Das (University of Tennessee, Knoxville) (2014-2016).**
  - 2) **Dr. Riddhi Shah (University of Tennessee, Knoxville) (2019-2020).**
  - 3) **Miss. Winnie Shi (Rice University) (2023- ).**
- **Interns (3):**
  - 1) **Dr. Yan Jin (University of Cincinnati) (2019), Astro (Ph.D.) intern.**
  - 2) **Mr. Sampson Canacoo (University of Texas, Rio Grande Valley) (2022), SULI intern.**
  - 3) **Mr. Enrique Contreras Lopez (University of Texas, Rio Grande Valley). (2022), SULI intern.**

## Awards

- **2020 Neutron Scattering Division Award: Best Experiment.**

- **2019 UT-Battelle Recognition/Award night: Director's Award for Outstanding Team Accomplishment.**
- **2019 UT-Battelle Recognition/Award night: Research Accomplishment.**
- **Distinguished Scientific Paper (2014)**, Center for Nanophase Materials Sciences (CNMS), Oak Ridge National Laboratory.
- **Excellence in Doctoral Research (2008)**, State University of New York at Stony Brook.

## **Research Proposals**

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- **FY16 Laboratory Directed Research and Development (LDRD 7938) Fund (PI).**  
“Rational design of deuterated conjugated polymers with controlled spin polarized electron transport”.
- **FY23 Neutron Scattering Division Post Doc Research Grant (PI).**  
“Continuous Microporous Polymeric Hollow Fibers for Oil/Water Separation and Environmental Remediation: *In-situ*. USANS/SANS and SAXS/WAXS Study ”
- **FY24 Laboratory Directed Research and Development (LDRD 11485) Fund (co-PI).**  
“Polyester Enzymatic Synthesis and Screening Method Development”.
- **FY22 Laboratory Directed Research and Development (LDRD 10716) Fund (co-PI).**  
“High Throughput Polymer Characterization”.
- **FY21 Laboratory Directed Research and Development (LDRD 10666) Fund (co-PI).**  
“CO<sub>2</sub> capture mediated by supramolecular amine-salt network”.
- **FY21 Laboratory Directed Research and Development (LDRD 10145) Fund (co-PI).**  
“Tailoring Morphology for a New Class of Carbon Fibers”.
- **FY20 Laboratory Directed Research and Development (LDRD 9899) Fund (co-PI).**  
“Surpassing Stiffness-Extensibility Trade-off in Elastomers”.
- **FY17 Laboratory Directed Research and Development (LDRD 8360) Fund (co-PI).**  
“Understanding rheology of fiber reinforced soft matter structural composites: From microscopic structures to macroscopic mechanical properties”.

## **External Activities**

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- **Editorial Advisory Board member.**  
Materials (2023- ).
- **Session chair.**  
American Chemical Society (ACS), (2023- ).  
- Polymeric Materials: Science and Engineering Division (PMSE).
- **Journal article reviewer (2011- ).**  
- Advanced Functional Materials.  
- Macromolecules.  
- Soft Matter.  
- Scientific Reports.  
- Journal of Materials Chemistry C.  
- ACS Macro Letters.  
- RSC Advances.  
- Polymer.  
- Materials Today Nano.  
- Materials Letters.  
- Materials.

## Internal Activities (ORNL)

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- "Doing it Better" award subcommittee (2023-).  
Neutron Scattering Division.
- LDRD/SEED proposal reviewer (2013-).
- Resolution paper/conference paper reviewer (2013-).
- Interview panel (2015-).

## Invited Talks (5)

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1. "Morphological origin for the stratification of P3HT:PCBM blend films studied by neutron reflectometry", *Department of Chemical and Materials Engineering, University of Cincinnati (2012)*.
2. "Correlating High Power Conversion Efficiency of PTB7:PC<sub>7,1</sub>BM Inverted Organic Solar Cells to Nanoscale Structure Using Neutron Scattering", *Department of Advanced Materials, Hannam University (2018)*.
3. "Solvent quality-induced nucleation and growth of parallelepiped nanorods in dilute poly(3-hexylthiophene) (P3HT) solution and the impact on the crystalline morphology of solution-cast thin film", *Department of Polymer Science and Engineering, Pusan National University (2018)*.
4. "Scattering Data Measurement, Reduction and Analysis at the CNMS/SNS X-Ray Laboratory", Software Imaging workshop, *Neutron Scattering Division, Oak Ridge National Laboratory (2019)*.
5. "The conformations of polyzwitterion chains and its coacervates in aqueous solutions studied by ORNL small-angle X-ray scattering instrument", Charged polymer workshop, *Center for Nanophase Materials Sciences, Oak Ridge National Laboratory (2023)*.

## Research Interests

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- Application of neutron/X-ray scattering/reflectivity/diffraction.
  - Studying the structure and morphology of soft matters and nanomaterials.
- Solution behaviors of charged polymers.
  - Utilizing neutron/X-ray scattering.
- 1D and 2D X-ray scattering/diffraction modeling.
  - Model refinement for comprehensive analysis.
- Processing-structure-property of polymers, functional nanomaterials, and polymer nanocomposites.
- Physics of phase transition of polymeric materials.
- Developments of neutron/X-ray scattering sample environments.

## Expertise

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- Techniques:
  - Small-angle neutron/X-ray scattering (SANS/SAXS).
  - Neutron/X-ray reflectivity (NR/XRR).
  - X-ray diffraction (XRD).
- Instrumentation:
  - In-house SAXS instrumentation: Kratky camera.
  - In-house SAXS instrumentation: 2-Pinhole camera.
  - X-ray reflectometer.
- Software proficiency:
  - Igor Pro.

- . Scattering model building.
- . Coding for SAXS/SANS data model refinement.
- Wolfram Mathematica.
  - . Scattering model building.
  - . Coding for scattering/reflectivity data model refinement.
- **Thermal analysis**
  - Differential scanning calorimetry (DSC)
  - Thermogravimetric analysis (TGA)

## Peer-Reviewed Journal Papers

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### 2024 (6)

1. "Amplifying nanoparticle reinforcement through low volume topologically controlled chemical coupling", Nihal Kanbargi , Joshua T. Damron , Yawei Gao , Logan T. Kearney , Jan Michael Carrillo , Jong K. Keum , Bobby G. Sumpter , Amit K. Naskar, *ACS Macro Letters* 13, 280 (2024). (*Journal cover*)
2. "Multiferroism in strained strontium hexaferrite epitaxial thin films", Joonhyuk Lee, Sam Yeon Cho, Inhwon Kim, Christopher M. Rouleau, Kungwan Kang, Sangkyun Ryu, Yunseok Heo, Jong K. Keum, Daniel M. Pajerowski, Younghak Kim, Sang Don Bu, Jaekwang Lee, Hyoungjeen Jeen, *Physical Review Materials* 8, 024401 (2024).
3. "Structure and lattice excitations of the copper substituted lead oxyapatite  $Pb_{9.06(7)}Cu_{0.94(6)}(PO_{3.92(4)})_6O_{0.96(3)}$ ", Qiang Zhang, Yingdong Guan, Yongqiang Cheng, Lujin Min, Jong K Keum, Zhiqiang Mao, Matthew B Stone, *Physical Review Materials* 8, 014605 (2024).
4. "Probing the Interface Structure of Block Copolymer Compatibilizers in Semi-crystalline Polymer Blends", Xiaomin Tang, Changhao Liu, Jihua Chen, Rajeev Kumar, Christopher Bowland, Tomonori Saito, Brent E. Dial, Jong K. Keum, Changwoo Do, X. Chelsea Chen, *Journal of Applied Polymer Science*, e55178 (2024). (*Lead author*).
5. "Nanoscale ion transport enhances conductivity in solid polymer-ceramic lithium electrolytes", Georgios Polizos, Monojoy Goswami, Jong K. Keum, Lilin He, Charl J. Jafta, Jaswinder Sharma, Yangyang Wang, Logan T. Kearney, Runming Tao, and Jianlin Li, *ACS Nano* 18 (4), 2750 (2024). (*Journal cover*).
6. "Direct Visualization of Charge Migration in Bilayer Tantalum Oxide Films by Multimodal Imaging", Matthew Flynn-Hepford, John Lasseter, Ivan Kravchenko, Steven Randolph, Jong Keum, Bobby G Sumpter, Stephen Jesse, Petro Maksymovych, A Alec Talin, Matthew J Marinella, Philip D Rack, Anton V Ievlev, Olga S Ovchinnikova, *Advanced Electronic Materials* 10 (1), 2300589 (2024). (*Journal cover*)

### 2023 (28)

7. "Enhanced Ferromagnetism in Monolayer Cr<sub>2</sub>Te<sub>3</sub> via Topological Insulator Coupling", Yunbo Ou, Murod Mirzhalilov, Norbert M Nemes, Jose L Martinez, Mirko Rocci, Austin Akey, Wenbo Ge, Dhavala Suri, Yiping Wang, Haile Ambaye, Jong Keum, Mohit Randeria, Nandini Trivedi, Kenneth S Burch, David C Bell, Weida Wu, Don Heiman, Valeria Lauter, Jagadeesh S Moodera, Hang Chi, *arXiv preprint arXiv:2312.15028* (2023).
8. "Exchange coupling in Bi<sub>2</sub>Se<sub>3</sub>/EuSe heterostructures and evidence of interfacial antiferromagnetic order formation", Ying Wang, Valeria Lauter, Olga Maximova, Shiva T Konakanchi, Pramey Upadhyaya, Jong Keum, Haile Ambaye, Jiashu Wang, Maksym Zhukovskyi, Tatyana A Orlova, Badih A Assaf, Xinyu Liu, Leonid P Rokhinson, *Phys. Rev. B* 108, 195308, (2023). (*Journal cover*).
9. "Interface-enhanced conductivities in surfactant-mediated, solution-grown ionic crystalline complexes", Chen, Jihua; Keum, Jong; Wang, Yangyang; Wang, Hanyu; Lokitz, Bradley; Yang, Guang; Yuan, Yue; Kumar, Rajeev; Advincula, Rigoberto, *Frontiers in Nanotechnology* 5, Article number 1293801 (2023).

10. "Highly Recyclable and Tough Elastic Vitrimers from a Defined Polydimethylsiloxane Network", Jiancheng Luo, Xiao Zhao, Hao Ju, Xiangjun Chen, Sheng Zhao, Zoriana Demchuk, Bingrui Li, Vera Bocharova, Jan-Michael Y. Carrillo, Jong K. Keum, Sheng Xu, Alexei P. Sokolov, Jiayao Chen, Peng-Fei Cao, *Angewandte Chemie International Edition* 62 (47), e202310989 (2023).
11. "Liquid Crystalline Elastomers with Tailorable Actuation Performance Based on Orthogonal Click Chemistries", Zhixiang Dong, Yumeng Liu, Jianxia Chen, Jian Ding, Yuexin Fan, Tuan Liu, Jiajun Wang, Tuhua Zhong, Collin Pekol, Orlando Rios, Jong Keum, Min Xia, Naisheng Jiang, Yuzhan Li, *Macromolecules* 56 (23), 9455 (2023).
12. "Armor for Steel: Facile Synthesis of Hexagonal Boron NitrideFilms on Various Substrates", Ivan Vlassiouk, Sergei Smirnov, Alexander Puretzky, Olugbenga Olunloyo, David B. Geohegan, Ondrej Dyck, Andrew R. Lupini, Raymond R. Unocic, Harry M. Meyer III, Kai Xiao, Dayrl Briggs, Nickolay Lavrik, Jong Keum, Ercan Cakmak, Sumner B. Harris, Marti Checa, Liam Collins, John Lasseter, Reece Emery, John Rayle, Philip D. Rack, Yijing Stehle, Pavan Chaturvedi, Piran R. Kidambi, Gong Gu Ilia Ivanov, *Advanced Materials Interfaces* 11, 2300704 (2023). (Journal cover).
13. "Fluorescent aggregate structure revealed in bisphenol F epoxy thermoset", Derek B Dwyer, Evan R Glaser, Christopher A Klug, Sara Isbill, Jong K Keum, Wim Bras, Jennifer L Niedziela, Andrew J Miskowiec, *Polymer* 283, 126217 (2023).
14. "Tailoring chemical absorption-precipitation to lower the regeneration energy of a CO<sub>2</sub> capture solvent", Gyoung Gug Jang, Gang Seob Jung, Abishek Kasturi, Jiho Seo, Jong K Keum, Mina Yoon, Josh T Damron, Amit K Naskar, Radu Custelcean, Sotira Yiaccoumi, Costas Tsouris, *Chemsuschem* 17, e202300735-e202300735 (2023).
15. "Energy gap of topological surface states in proximity to a magnetic insulator", Jiashu Wang, Tianyi Wang, Mykhaylo Ozerov, Zhan Zhang, Joaquin Bermejo-Ortiz, Seul-Ki Bac, Hoai Trinh, Maksym Zhukovskyi, Tatyana Orlova, Haile Ambaye, Jong Keum, Louis-Anne de Vaulchier, Yves Guldner, Dmitry Smirnov, Valeria Lauter, Xinyu Liu, Badih A Assaf, *Communications Physics* 6(1), 200 (2023).
16. "Tuning Ionic Conductivity in Fluorite Gd-Doped CeO<sub>2</sub>-Bixbyite RE<sub>2</sub>O<sub>3</sub> (RE = Y and Sm) Multilayer Thin Films by Controlling Interfacial Strain", Gene Yang, Mohammad El Loubani, Habib Rostaghi Chalaki, Jiwon Kim, Jong K Keum, Christopher M Rouleau, Dongkyu Lee, *ACS Applied Electronic Materials* 5(8), 4556-4563 (2023).
17. "Single Ion Conducting Hairy Nanoparticle Additive to Improve Cycling Stability of Solid Polymer Electrolytes", Vera Bocharova, Xi Chelsea Chen, Seung Pyo Jeong, Zhengping Zhou, Robert L Sacci, Jong K Keum, Catalin Gainaru, Md Anisur Rahman, Ritu Sahori, Xiao-Guang Sun, Pengfei Cao, Andrew Westover, *ACS Applied Energy Materials* 6(15), 8042-8052 (2023).
18. "Thermally Induced Structural Transitions in Epoxy Thermoset Polymer Networks and Their Spectroscopic Responses", Derek B Dwyer, Sara Isbill, Zachary E Brubaker, Jong K Keum, Wim Bras, Jennifer L Niedziela, *ACS Applied Polymer Materials* 5(8), 5961-5971 (2023).
19. "Polyester-based epoxy vitrimer integrating spent coffee ground as a natural filler", *Composites Part B: Engineering* 260, 110756 (2023). Jiho Seo, Logan T Kearney, Michael D Toomey, Jong K Keum, Amit K Naskar, *Composites Part B: Engineering* 260, 110756 (2023).
20. "Anti-polyelectrolyte and polyelectrolyte effects on conformations of polyzwitterionic chains in dilute aqueous solutions", Zening Liu, Jong K Keum, Tianyu Li, Jihua Chen, Kunlun Hong, Yangyang Wang, Bobby G Sumpter, Rigoberto Advincula, Rajeev Kumar, *PNAS Nexus* 2 (7), pgad204 (2023). (Lead author)
21. "Strain-tunable Berry curvature in quasi-two-dimensional chromium telluride", Hang Chi, Yunbo Ou, Tim B Eldred, Wenpei Gao, Sohee Kwon, Joseph Murray, Michael Dreyer, Robert E Butera, Alexandre C Foucher, Haile Ambaye, Jong Keum, Alice T Greenberg, Yuhang Liu, Mahesh R Neupane, George J de Coster, Owen A Vail, Patrick J Taylor, Patrick A Folkes, Charles Rong, Gen Yin, Roger K Lake, Frances M Ross, Valeria Lauter, Don Heiman, Jagadeesh S Moodera, *Nature Communications* 14, Article number: 3222 (2023)

22. "Effects of Salt on Phase Behavior and Rheological Properties of Alginate–Chitosan Polyelectrolyte Complexes", Anandavalli Varadarajan, Logan T Kearney, Jong K Keum, Amit K Naskar, Santanu Kundu, *Biomacromolecules* 24, 6, 2730 (2023).
23. "Synthesis and Morphological Characterization of Linear and Miktoarm Star Poly (solketal methacrylate)-block-Polystyrene Copolymers", Polyxeni P Angelopoulou, Maria-Malvina Stathouraki, Jong K Keum, Kunlun Hong, Apostolos Avgeropoulos, Georgios Sakellariou, *European Polymer Journal* 190, 111995, (2023).
24. "A Sustainable Multi-Dimensional Printable Material", Ngoc A Nguyen, Christopher C Bowland, Lilin He, Naresh C Osti, Minh D Phan, Jong K Keum, Madhusudan Tyagi, Kelly M Meek, Kenneth C Littrell, Eugene Mamontov, John Ankner, Amit K Naskar, *Advanced Sustainable Systems*, 2300079 (2023). (Journal cover).
25. "Atmospheric Pressure Plasma Treatment of Magnesium Alloy for Enhanced Coating Adhesion and Corrosion Resistance", Gyoung Gug Jang, Jiheon Jun, Sinchul Yeom, Mina Yoon, Yi Feng Su, John Wade, Michael S Stephens, Jong K Keum, *Coatings* 13 (5), 897 (2023)
26. "Photocarrier-induced persistent structural polarization in soft-lattice lead halide perovskites", Qi Qian, Zhong Wan, Hiroyuki Takenaka, Jong K Keum, Tyler J Smart, Laiyuan Wang, Peiqi Wang, Jingyuan Zhou, Huaying Ren, Dong Xu, Yu Huang, Yuan Ping, Xiangfeng Duan, *Nature Nanotechnology* 18, pages357–364 (2023).
27. "Ultra-fast Microwave Regeneration of CO<sub>2</sub> Solid Sorbents for Energy-Efficient Direct Air Capture", Gyoung G. Jang, Abishek Kasturi, Diāna Stamberga, Radu Custelcean, Jong K. Keum, Sotira Yiacoumi, Costas Tsouris. *Separation and Purification Technology* 309, 123053 (2023).
28. "Continuous Recovery of Phosphoric Acid and Rare-Earths Containing Particles from Phosphoric Acid Sludge Using a Decanter Centrifuge", Gyoung G Jang, Austin Ladshaw, Jong K Keum, Joshua A Thompson, Patrick Zhang, Costas Tsouris, *Chemical Engineering Journal* 458, 141418 (2023).
29. "Control of crystallographic orientation in Ruddlesden-Popper for fast oxygen reduction", Yang, Gene; El Loubani, Mohammad; Hill, David; Keum, Jong K; Lee, Dongkyu; *Catalysis Today* 409, 87 (2023).
30. "Understanding curing dynamics of arylacetylene and phthalonitrile thermoset blends", Laskoski, Matthew; Dyatkin, Boris; Osti, Naresh C; Keum, Jong K; Mamontov, Eugene; Butler, Tristan; *Journal of Polymer Science* 61 (2), 132 (2023).
31. "Leveraging peptide–cellulose interactions to tailor the hierarchy and mechanics of peptide–polymer hybrids", Daseul Jang, Laura E Beckett, Jong Keum, LaShanda TJ Korley, *Journal of Materials Chemistry B* 11, 5594-5606 (2023).
32. "High- $\chi$  diblock copolymers containing poly (vinylpyridine-N-oxide) segments", Polyxeni P Angelopoulou, Logan T Kearney, Jong K Keum, Liam Collins, Rajeev Kumar, Georgios Sakellariou, Rigoberto C Advincula, Jimmy W Mays, Kunlun Hong, *Journal of Materials Chemistry A* 11, 9846-9858 (2023).
33. "Formation of carbon and oxygen rich surface layer on high purity magnesium by atmospheric carbon dioxide plasma", Gyoung G Jang, Sinchul Yeom, Jong K Keum, Mina Yoon, Harry III Meyer, Yi-Feng Su, Jiheon Jun, *Journal of Magnesium and Alloys* 11(1), 88 (2023).
34. "Alternate Synthesis Method for High-Performance Manganese Rich Cation Disordered Rocksalt Cathodes", Shripad Patil, Devendrasinh Darbar, Ethan C. Self, Thomas Malkowski, Vincent C. Wu, Raynald Giovine, Nathan J. Szymanski, Rebecca D. McAuliffe, Bo Jiang, Jong K. Keum, Krishna P. Koirala, Bin Ouyang, Katharine Page, Chongmin Wang, Gerbrand Ceder, Raphaële J. Clément, Jagjit Nanda, *Advanced Energy Materials* 134 (4), 2203207 (2023).

## 2022 (15)

35. "Structure–Dynamics Interrelation Governing Charge Transport in 2 Cosolvated Acetonitrile/LiTFSI Solutions", Murillo L. Martins, Xiaobo Lin, Catalin Gainaru, Jong K. Keum, Peter T. Cummings, Alexei P. Sokolov, Robert L. Sacci, and Eugene Mamontov, *The Journal of Physical Chemistry* 127 (1), 308 (2022).

36. "Neutron tomography of porous aluminum electrodes used in electrocoagulation of groundwater", Gyoung Gug Jang, Yuxuan Zhang, Jong K Keum, Yousuf Z Bootwala, Marta C Hatzell, David Jassby, Costas Tsouris, *Frontiers in Chemical Engineering* 4, (2022)
37. "Understanding the Fluorination of Disordered Rocksalt Cathodes through Rational Exploration of Synthesis Pathways", Szymanski, Nathan J; Zeng, Yan; Bennett, Tyler; Patil, Shripad; Keum, Jong K; Self, Ethan C; Bai, Jianming; Cai, Zijian; Giovine, Raynald; Ouyang, Bin; *Chemistry of Materials* 34 (15), 7015 (2022).
38. "Photoinduced iodide repulsion and halides-demixing in layered perovskites", Liu, Yongtao; Wang, Miaosheng; levlev, Anton V; Ahmadi, A; Keum, JK; Ahmadi, M; Hu, B; Ovchinnikova, OS; *Materials Today Nano* 18, 100197 (2022).
39. "Tailoring compatibilization potential of maleic anhydride-grafted polypropylene by sequential rheochemical processing of polypropylene and polyamide 66 blends", Seo, Jiho; Kearney, Logan T; Datta, Siddhant; Toomey, Michael D; Keum, Jong K; Naskar, Amit K; *Polymer Engineering & Science* 62 (8), 2419 (2022). (*Journal cover*).
40. "The influence of temperature on the strain-hardening behavior of Fe-22/25/28Mn-3Al-3Si TRIP/TWIP steels", Pierce, Dean T; Benzing, JT; Jiménez, JA; Hickel, Tilmann; Bleskov, Ivan; Keum, Jong; Raabe, Dierk; Wittig, JE; *Materialia* 22, 101425 (2022).
41. "Ionic Conductivity Enhancement of Polymer Electrolytes by Directed Crystallization", Liu, Changhao; Tang, Xiaomin; Wang, Yangyang; Sacci, Robert L; Bras, Wim; Keum, Jong K; Chen, X Chelsea; *ACS Macro Letters* 11(4), 595 (2022). (*Lead author*), (*Journal cover*).
42. "Electroprecipitation Mechanism Enabling Silica and Hardness Removal through Aluminum-Based Electrocoagulation", Liu, Yu-Hsuan; Bootwala, Yousuf Z; Jang, Gyoung Gug; Keum, Jong K; Khor, Chia Miang; Hoek, Eric MV; Jassby, David; Tsouris, Costas; Mothersbaugh, Jim; Hatzell, Marta C; *ACS ES&T Engineering* 2(7), 1200 (2022).
43. "Reduced Graphene Oxide Aerogels with Functionalization-Mediated Disordered Stacking for Sodium-Ion Batteries", Park, Jaehyeung; Sharma, Jaswinder; Jafta, Charl J; He, Lilin; Meyer III, Harry M; Li, Jianlin; Keum, Jong K; Nguyen, Ngoc A; Polizos, Georgios; *Batteries* 8 (2), 12 (2022).
44. "Modular Approach for the Synthesis of Bottlebrush Diblock Copolymers from Poly (Glycidyl Methacrylate)-block-Poly (Vinylidimethylazlactone) Backbones", Hu, Bin; Carrillo, Jan-Michael; Collins, Liam; Silmore, Kevin S; Keum, Jong; Bonnesen, Peter V; Wang, Yangyang; Retterer, Scott; Kumar, Rajeev; Lokitz, Bradley S; *Macromolecules* 55 (2), 488 (2022).
45. "Surpassing the stiffness-extensibility trade-off of elastomers via mastering the hydrogen-bonding clusters", Zhang, Zhen; Luo, Jiancheng; Zhao, Sheng; Ge, Sirui; Carrillo, Jan-Michael Y; Keum, Jong K; Do, Changwoo; Cheng, Shiwang; Wang, Yangyang; Sokolov, Alexei P; *Matter* 5(1), 237 (2022).
46. "Upcycling of semicrystalline polymers by compatibilization: mechanism and location of compatibilizers", Tang, Xiaomin; Liu, Changhao; Keum, Jong; Chen, Jihua; Dial, Brent E; Wang, Yangyang; Tsai, Wan-Yu; Bras, Wim; Saito, Tomonori; Bowland, Christopher C, X. Chelsea Chen; *RSC advances* 12(18), 10886 (2022).
47. "Magnetic charge and geometry confluence for ultra-low forward voltage diode in artificial honeycomb lattice", Yumnam, George; Guo, Jiasen; Chen, Yiyao; Dahal, Ashutosh; Ghosh, Pousali; Cunningham, Quinn; Keum, Jong; Lauter, Valeria; Abdullah, Amjed; Almasri, Mahmoud; *Materials Today Physics* 22, 100574 (2022).

## 2021 (11)

48. "Strain in metal halide perovskites: the critical role of A-site cation", Liu, Yongtao; Sumpter, Bobby G; Keum, Jong K; Hu, Bin; Ahmadi, Mahshid; Ovchinnikova, Olga S; *ACS Applied Energy Materials* 4(3), 2068 (2021). (*Journal cover*).

49. "Unraveling the Role of Neutral Units for Single-Ion Conducting Polymer Electrolytes", Zhao, Sheng; Song, Shenghan; Wang, Yingqi; Keum, Jong; Zhu, Jiadeng; He, Yi; Sokolov, Alexei P; Cao, Peng-Fei; *ACS Applied Materials & Interfaces* 13 (43), 51525 (2021).
50. "Quantum disordered state of magnetic charges in nanoengineered honeycomb lattice", Yumnam, George; Chen, Yiyao; Guo, Jiasen; Keum, Jong; Lauter, Valeria; Singh, Deepak Kumar; *Advanced Science* 8(6), 2004103 (2021).
51. "Optically Induced Static Magnetization in Metal Halide Perovskite for Spin-Related Optoelectronics", Wang, Miaosheng; Xu, Hengxing; Wu, Ting; Ambaye, Haile; Qin, Jiajun; Keum, Jong; Ivanov, Ilia N; Lauter, Valeria; Hu, Bin; *Advanced Science* 8(11), 2004488 (2021).
52. "Influence of Heterointerfaces on the Kinetics of Oxygen Surface Exchange on Epitaxial La<sub>1.85</sub>Sr<sub>0.15</sub>CuO<sub>4</sub> Thin Films", Yang, Gene; Kim, So Yeun; Sohn, Changhee; Keum, Jong K; Lee, Dongkyu; *Applied Sciences* 11(9), 3778 (2021).
53. "Study of the segmental dynamics and ion transport of solid polymer electrolytes in the semi-crystalline state", Chen, Xi Chelsea; Sacci, Robert L; Osti, Naresh C; Tyagi, Madhusudan; Wang, Yangyang; Keum, Jong K; Dudney, Nancy J; *Frontiers in Chemistry* 8, 592604 (2021).
54. "Corrosion Prevention of Additively Manufactured Aluminum Packing Devices Developed for Process Intensification of CO<sub>2</sub> Capture by Aqueous Amines", Jang, Gyoung G; Jun, Jiheon; Su, Yi-Feng; Keum, Jong K; DeFelice, Vincent; Decarmine, Tony; Jones, Jonaaron; Tsouris, Costas; *Industrial & Engineering Chemistry Research* 60(47), 17036 (2021).
55. "Nanostructured ligament and fiber Al-doped Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> scaffolds to mediate cathode-electrolyte interface chemistry", Polizos, Georgios; Sharma, Jaswinder; Jafta, Charl J; Muralidharan, Nitin; Veith, Gabriel M; Keum, Jong K; Kukay, Alexander; Sahore, Ritu; Wood III, David L; *Journal of Power Sources* 513, 230551 (2021).
56. "Multiscale Structural Characterization of a Smectic Liquid Crystalline Elastomer upon Mechanical Deformation Using Neutron Scattering", Li, Yuzhan; Keum, Jong K; Wang, Jun; Jiang, Naisheng; Bras, Wim; Kessler, Michael R; Rios, Orlando; *Macromolecules* 54(22), 10574 (2021).
57. "Phase segregation mechanisms of small molecule-polymer blends unraveled by varying polymer chain architecture", Chen, Jihua; Das, Sanjib; Shao, Ming; Li, Guoliang; Lian, Huada; Qin, Jian; Browning, James F; Keum, Jong K; Uhrig, David; Gu, Gong; *SmartMat* 2(3), 367 (2021). (Journal cover).

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## Professional Memberships

- American Chemical Society.
- American Physical Society.
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