

# Physics & beyond

## MPI Colloquium

11 October / 2:30 / Lecture Hall  
2023 / pm / B.1.11



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## Materials design and fabrication for light sensing, energy efficiency, solar electricity production, and CO<sub>2</sub> capture and reduction

The global community has made major advances in developing and deploying materials – from quantum dots to 2D materials to perovskites and high-entropy alloys – for applications in sustainability. I will overview some of our group's recent contributions, focusing especially on light detection [1], LEDs [2], perovskite solar cells [3] including tandem [4] and triple-junction photovoltaics [5], and CO<sub>2</sub> capture and upgrade [6].

- [1] A. Najarian, ... E. H. Sargent, "Homomeric chains of intermolecular bonds scaffold octahedral germanium perovskites," *Nature*, 2023.
- [2] D. Ma, ... E. H. Sargent, "Distribution control enables efficient reduced-dimensional perovskite LEDs," *Nature*, 2022.
- [3] S. M. Park, ... E. H. Sargent, "Engineering ligand reactivity enables high-temperature operation of stable perovskite solar cells," *Nature*, 2023.
- [4] R. Lin, ... E. H. Sargent, H. Tan, "All-perovskite tandem solar cells with improved grain surface passivation," *Nature*, 2022.
- [5] Z. Wang, ... E. H. Sargent, "Suppressed phase segregation for triple-junction perovskite solar cells," *Nature*, 2023.
- [6] J. Jin, J. Wicks, ... E. H. Sargent, Y. Pang, "Constrained C<sub>2</sub> adsorbate orientation enables CO-to-acetate electroreduction," *Nature* 2023.

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