Benjamin J. Roman

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Education:

Texas A&M University, College Station: Ph.D. in Physical Chemistry, 2020.
Dissertation: Highly Fluorescent Cesium Lead Tribromide Nanocrystals for Luminescence Up-Conversion

University of North Texas, Denton: B.S., *summa cum laude*, in Chemistry, 2014.

Research Experience:

2020 – : Post-Doctoral Research Associate, Chemical Engineering
Delia Milliron Group, University of Texas at Austin

2015 – 2020: Graduate Student Research Assistant, Chemistry
Matthew Sheldon Group, Texas A&M University, College Station

- Examined one photon photoluminescence up-conversion in all-inorganic lead halide perovskite nanocrystals using fluorescence microscopy.
- Designed a method for optical thermometry using the thermal dependence of one photon up-conversion and used this thermometry technique to show that $CsPbBr_3$ nanoparticles can be cooled using below-gap optical excitation.
- Collaborated with a team of researchers to elucidate the formation mechanism of $CsPbBr_3$ nanoparticles.
- Designed a method for room temperature deposition of gold nanoparticles onto the surface of all-inorganic lead halide perovskite nanocrystals.

2014 – 2014: Undergraduate Research Assistant, **Chemistry**
Paul Marshall Group, University of North Texas

Honors and Awards:

- DOW Chemical Graduate Scholarship (2020)
- Young Researcher's Conference 2nd Place Poster Presentation Award (2019)
- Texas A&M Conference on Energy Best Oral Presentation Award (2017)
- Texas A&M University Association of Former Students Graduate Merit Fellowship (2015 – 2019)
- University of North Texas James L. Carrico Award (2015)

Journal Publications:

7) **B. Roman**, M. Sheldon. "Optically Cooling $CsPbBr_3$ Nanoparticles." *Nano Letters*, **2020**, *20*, 8874–8879.

6) J-R. Wen, **B. Roman**, F. Rodriguez Ortiz, N. Mireles Villegas, N. Porcellino, M. Sheldon. "Chemical Availability of Bromide Dictates $CsPbBr_3$ Growth." *Chemistry of Materials*, **2019**, *31*, 8551-8557.

5) F. Rodriguez Ortiz, **B. Roman**, J.-R. Wen, N. Mireles Villegas, D. Dacres, M. Sheldon. "The Role of Gold Oxidation State in the Synthesis of Au-$CsPbX_3$ Heterostructure or Lead-free $Cs_2Au^{I}Au^{III}X_6$ Perovskite Nanoparticles." *Nanoscale*, **2019**, *11,* 18109-18115.

4) **B. Roman**, M. Sheldon. "Six-fold Plasmonic Enhancement of Thermal Scavenging via $CsPbBr_3$ Anti-Stokes Photoluminescence." *Nanophotonics*, **2019**, *8*, 599-605.

3) **B. Roman**, M. Sheldon. "The role of mid-gap states in all-inorganic $CsPbBr_3$ nanoparticle one photon up-conversion." *Chemical Communications*, **2018**, *54*, 6851-6854.

2) **B. Roman**, J. Otto, C. Galik, R. Downing, M. Sheldon. "Au Exchange or Au Deposition: Dual Reaction Pathways in Au-$CsPbBr_3$ Heterostructure Nanoparticles." *Nano Letters,* **2017**, *17* (9), 5561.

1) D. Parobek, **B. Roman**, Y. Dong, H. Jin, E. Lee, M. Sheldon, D. H. Son. "Exciton-to-Dopant Energy Transfer in Mn-Doped Cesium Lead Halide Perovskite Nanocrystals." *Nano Letters*, **2016**, *16* (12), 7376.

Selected Oral Presentations:

03.2022	American Chemical Society National Meeting, San Diego CA
01.2022	Penn State Postdoctoral Fellows Seminar and Symposium, State College, PA
09.2019	Texas A&M Conference on Energy, College Station TX
04.2019	Material Research Society National Meeting, Phoenix AZ
03.2019	Texas A&M Student Research Week, College Station TX
03.2018	Texas A&M Conference on Energy, College Station TX
03.2018	American Chemical Society National Meeting, New Orleans LA
09.2017	Texas A&M Conference on Energy, College Station TX
08.2017	American Chemical Society National Meeting, Washington DC
03.2017	Texas A&M Student Research Week, College Station TX
09.2016	Texas A&M Conference on Energy, College Station TX

Selected Poster Presentations:

03.2022	American Chemical Society National Meeting, San Diego CA
06.2019	Young Researchers Conference, College Station TX
03.2019	Texas A&M Cotton Medal Symposium, College Station TX
07.2018	Gordan Research Conference, Colloidal Semiconductor Nanocrystals, Smithfield RI
07.2018	Gordan Research Seminar, Colloidal Semiconductor Nanocrystals, Smithfield RI
05.2017	DOW Chemical Student Symposium, College Station TX
07.2016	Gordan Research Conference, Colloidal Semiconductor Nanocrystals, West Dover VT

Service & Outreach:

2021: **Undergraduate Research Strategies Seminar, Panel Member**
Center for Dynamics and Control of Materials, University of Texas, Austin TX

2021 – : **Postdoctoral Mentor for Undergraduate Research Assistants**
- Grant Shim (Fall 2021 – Present)
- Victoria Kyveryga (REU, Summer 2021)
- Mohamed Faris (REU, Summer 2021)

2016 – : **Peer Reviewer**
- Provided critical feedback for 17 articles.

2015 – 2018: **Graduate Mentor for Undergraduate Research Assistants**
** denotes authorship credit on a publication*
- Nicholas Porcellino* (January 2018 – December 2018)
- Richard Reyes (REU, Summer 2018)
- David Dacres* (REU, Summer 2017)
- Rachel Davidson* (REU, Summer 2016)
- Joseph Otto* (January 2016 – December 2016)
- Christopher Galik* (August 2015 – December 2016)
- Jennifer Miller (REU, Summer 2015)

2015 – 2016: **Graduate Teaching Assistant**
Department of Chemistry, Texas A&M University, College Station TX
- Taught 2 General Chemistry for Engineering Majors lab sections.

Workshops and Training:

2017 What Matters in Mentoring, University of Wisconsin-Madison.
2015 Mentoring Undergraduate Researchers Workshop, Texas A&M University.