

# LAXMIKANT LP PATHADE

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## EDUCATION

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- Syracuse University** **2013-2018**  
Ph.D. Candidate in *Materials Chemistry* with Prof. Mathew M. Maye  
Thesis: Internal Morphology & Corrosion Resistance in Stainless Steel Nanoparticles
- Institute of Chemical Technology, Mumbai (formerly UDCT)** **2009-2013**  
B.Tech. in *Chemical Technology*; Minors in *Chemical Engineering*

## HONORS AND AWARDS

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- TA Mentor Award by the Graduate School at Syracuse University (Fall, 2016)
- Conference Travel Award, Department of Chemistry at Syracuse University (2015, 2016)
- Danve Family Foundation Award for Academic Excellence (2007, 2013)
- Ranked Regionally in National Science Olympiad, India (NSO-SOF) (2006)
- Navodaya Scholarship for 7 consecutive years (HRD Ministry, Govt. of India) (2002-2009)

## TEACHING & MENTORING EXPERIENCE

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- Teaching Assistant at Syracuse University** **2013-present**
- Supervised many undergraduate trainees & summer *REU* researchers in the Maye lab.
  - Received Graduate Teaching Assistant Mentor Award from the Syracuse University Graduate School in 2016 for outstanding mentorship service to the incoming STEM teaching assistants.
  - Taught CHE 129 honors labs for four years Syracuse University & revamped the curriculum with Professor Maye. I also taught recitation classes (CHE 106-116), where I held office hours to help students with their chemistry homework and assisted in other assistant duties.
  - Developed 5 new lab modules to introduce advanced materials chemistry topics. These labs were specifically designed to introduce complicated research topics to freshman honors students, and challenge them early in their college research career. Topics include -
    - Synthesis of Cesium Lead Perovskite (CsPbX<sub>3</sub>) nanocrystals & Halide Exchange
    - Comparing Optical Property of Various Fluorescent Compounds using Spectrophotometers
    - Demonstration of Transmission Electron Microscope (TEM), & Atomic Force Microscope (AFM)
    - Solid State Modeling making & X-ray Diffraction"
    - Printing 3-D objects & Tour of the Maker-space Facility"

- School Teacher at State Govt. Public School in Maharashtra, India** **2011-2012**
- Taught Science, Math, English to middle school students at local public school.
  - Substituted for any planned or unplanned teacher absences. Assisted school headmaster in official duties.

## WORK & RESEARCH EXPERIENCE

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- Materials Chemistry Intern at Pelitex Inc.** **2017**
- Executed a synthesis scale-up & technology transfer project for a *Fortune 500* chemical company in record time.
  - Designed safety protocols for materials synthesis at increased scales, and improved waste recycling.
  - Collaborated with researchers to optimize the silica shell coating to improve hydrophilicity of products.

**X-ray Facility Administrator at Syracuse University** **2014-present**

- Trained new users on the diffractometer and the necessary safety protocols; coordinated user queue.
- Collaborated with internal & external users for specialized sample prep & data analysis.
- As part of my teaching assistant duties, I taught “Solid State Modeling and X-ray Diffraction” lab for chemistry honors students every fall.
- Maintained auxiliary operations & repaired minor breakdowns, Scheduled maintenance & regulatory inspections.

**Graduate Researcher at Syracuse University** **2013-present**

- Investigated synthetic design of transition metal core/shell type nanoparticles (NPs) that exhibited *hollow internal microstructures*. This study of diffusion & oxidation behavior in transition metal NPs is funded by NSF.
- Successfully exploited our findings to improve corrosion resistance in alloys NPs and create truly “*stainless*” NPs.
- Published **5** peer reviewed journal articles, filed **2** patents, and presented research in professional conferences.

OUTREACH ACTIVITIES & SERVICES

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- Served as a special awards judge for ASM Material Education Foundation at the Central New York Science & Engineering Fair, SRC Arena at Onondaga Community College, Syracuse, NY (supported by Lockheed Martin, SRC Inc., Bristol-Myers Squibb, Saab, NASA, and the Technological Association of Central NY) **(2017)**
- Volunteered at the *Maker-hall event* hosted by Technology Alliance of Central New York at the Annual Dr. MLK Jr. Community Celebrations, Nottingham High School, Syracuse, NY **(2016)**
- Student committee of the National Symposium on Functional Application of Colorants (NSFAC), held at ICT, Mumbai **(2011 & 2012)**

PROFESSIONAL ACTIVITIES

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- **X-ray Facility Administrator** (2014-present)  
As a graduate facilities administrator, I run day-to-day operations of the powder X-ray diffractometer (Bruker D8-Advance) at the X-ray facility in the chemistry department at Syracuse University.
- **Peer reviewer for journals publishing in the field of Nanoscience.**  
· Nanoscale (RSC) · Journal of Physical Chemistry (ACS) · Journal of Alloys and Compounds
- **Member of Professional Societies**  
American Chemical Society (ACS) · Material Research Society (MRS) · Society of Dyers and Colourists, India

SELECTED PUBLICATIONS (TOTAL 7)

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- Laxmikant Pathade, Rahiem Davon Slaton, Tennyson Doane, Mathew M. Maye “Corrosion Resistance Performance of Fe/CrNi Core-Alloy Nanoparticles in Solution and as Thin-Films.” (submitted, **2017**)
- Laxmikant Pathade, Tennyson Doane, Rahiem Davon Slaton, Mathew M. Maye “Understanding the Oxidation Behavior of Fe/Ni/Cr and Fe/Cr/Ni Core/Alloy Nanoparticles.” *J. Phys. Chem. C* **2016**, 120 (38), 22035–44 (doi: 10.1021/acs.jpcc.6b06926)
- Tennyson Doane, Kayla Ryan, Laxmikant Pathade, Kevin Cruz, Huidong Zang, Mircea Cotlet, Mathew M. Maye “Using Perovskite Nanoparticles as Halide Reservoirs in Catalysis and as Spectrochemical Probes of Ions in Solution.” *ACS Nano* **2016**, 10 (6), 5864–72 (doi: 10.1021/acsnano.6b00806)
- Slaton, Rahiem Davon, In-Tae Bae, Patrick S. Lutz, Laxmikant Pathade, Mathew M. Maye “The transformation of  $\alpha$ -Fe nanoparticles into multi-domain FeNi-M<sub>3</sub>O<sub>4</sub> (M=Fe, Ni) heterostructures by galvanic exchange.” *J. Mater. Chem. C* **2015**, 3 (24), 6367–6375 (doi: 10.1039/C5TC00929D)

PATENTS

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- Mathew M. Maye, Rahiem Davon Slaton, Laxmikant Pathade, Tennyson Doane “COMPOSITIONS OF NANOPARTICLES WITH RADIAL GRADIENTS AND METHODS OF USE THEREOF” US Provisional Patent, *Application #62/257,665*, Filed November 19, **2015**.
- Tennyson Doane, Mathew M. Maye, Laxmikant Pathade, Kayla Ryan “SYSTEM AND METHODS FOR VISUALIZING CHEMICAL REACTIONS IN REAL TIME” US Provisional Patent, *Application #62/231,318*, Filed September 02, **2015**.

## SELECTED PRESENTATIONS

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- “Understanding the Oxidation Behavior of Stainless Transition Metal Core/Alloy Nanoparticles.” (Talk) Northeast Regional Meeting of the ACS, Binghamton, NY (2016)
- “Oxidation resistance interfaces in colloidal core/alloy nanoparticles” (Talk), ACS National Meeting, Philadelphia, PA (2016)
- “Oxidation behavior of stainless core/alloy nanoparticles” (Poster), ACS National Meeting, Philadelphia, PA (2016)
- “Corrosion Resistant Surfaces via Transition Metal Nanoparticle Chemistry” (Talk) Three Minute Thesis competition, Syracuse University (2016)
- “Synthesis and processing of core/alloy nanoparticles with stainless interfaces” (Poster), ACS National Meeting, Boston, MA (2015)
- “Synthesis and processing of core/alloy nanoparticles with stainless interfaces” (Talk), Northeast Regional Meeting of the ACS, Ithaca, NY (2015)
- “A solution to Industry defined problem: To recover coconut fatty acid monoethanolamine (MEA) from 3percent MEA mixture” (Talk), Young Innovators Choice Competition, ICT, Mumbai. (2012)
- “Synthesis and Applications of Color Formers” (Talk), ICT, Mumbai (2012)
- “Sorbitol & sorbitan esters, and their ethoxylated derivatives” (Talk), ICT, Mumbai (2012)