Brian Beatty

Curriculum Vitæ

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Brian.R.Beatty@Drexel.edu

Education

2011-Present **M.S. Studies in Materials Science (Dual Degree)**, *Politecnico di Milano*, Milan, Italy.
Attended for academic year 2011-2012 as part of the initial group of students in the newly formed EAGLES International Exchange Program

2007-Present **B.S./M.S. Studies in Materials Science (Major)**, *Drexel University*, Philadelphia, PA.
Cumulative GPA: 3.56
Previous Six Quarters GPA: 3.92

Master's thesis

Title *Atomic Layer Deposition of Perovskite Oxide Thin Films*

Supervisors Dr. Jonathan E. Spanier — *Drexel University, Philadelphia, PA, USA*
Dr. Carlo S. Casari — *Politecnico di Milano, Milano, Italia*

Description Atomic Layer Deposition (ALD) has been shown to be capable of depositing ultra-thin films (<100 nm) of perovskite oxides. These are technologically valuable due to their wide range of properties, ranging from ferroelectricity and ferromagnetism to superconductivity. With the use of ALD, it becomes possible to deposit thin and conformal coatings of these materials to three-dimensional surfaces with the ability to carefully control thickness with sub-nanometer resolution. Research work focuses on the lead titanate ($PbTiO_3$) end group of the lead zirconate titanate ($PbTi_xZr_{1-x}O_3$) system.

Experience

Summer 2012 **Thesis Research**, *Universidad Politécnica de Madrid*, Madrid, Spain.
Three month period to be spent completing remaining experiments and authoring final M.S. thesis document and defense presentation in collaboration with research groups from Spain, Italy, and the USA.

2009–2011 **Research Experience**, *MesoMaterials Laboratory (MML)*, Drexel University.
Focused research on application of Atomic Layer Deposition to ferroelectric oxide thin films.
- *Co-Op Experiences* were 6 month periods (Spring/Summer) of full time employment at MML.
- *Student Research* was performed during periods when simultaneously attending courses.
  - 2011
    - Collaborated in development of ellipsometry analysis procedure for thin films
    - Designed new sub-system for ALD reactor, improving capabilities and minimizing precursor consumption
    - Lead international group in ALD oxide deposition, focused on both $PbTiO_3$ and $BiFeO_3$ systems
  - 2010
    - Applied statistics-based design of experiments to solve a problem with interfering variables
    - Model- and simulation-driven process optimization to select precursors for improving yields
    - Determination of alternative reaction materials
  - 2009
    - Assumed leadership of $PbTiO_3$ project
    - Assigned to management and upkeep of ALD reactor

Fall, 2011 **Abstract Accepted to MRS Fall Session**.
On results of oriented lead titanate thin film deposition via ALD onto single crystalline surfaces.

Summer 2008 **STAR: Summer Research Experience**, *MesoMaterials Laboratory*, Drexel University.
Ten week period spent learning to organize and develop a personal research project.
- Data analysis (using Matlab and Igor software packages)
- Training and over 150 hours of experience on various characterization tools

2007–2008 **Training in Atomic Layer Deposition**, *MesoMaterials Laboratory*, Drexel University.
Worked under graduate mentor Rahul Joseph researching application of advanced thin film deposition methods. Trained on operation and maintenance of ALD reactor,

Publications

April, 2012 **Shape-Controlled Vapor-Transport Growth of Tellurium Nanowires**, Christopher J. Hawley, Brian R. Beatty, Guannan Chen, and Jonathan E. Spanier, Crystal Growth & Design **2012** *12* (6), 2789–2793.

Equipment Experience

Thin Film Deposition Atomic Layer Deposition (ALD), Chemical Vapor Deposition (CVD), Pulsed Laser Deposition (PLD), Molecular Beam Epitaxy (MBE), Sol-Gel Deposition, Thermal Evaporation, R.F. Sputtering.

Film Analysis X-Ray Diffraction (XRD), X-Ray Reflectivity (XRR), Scanning Electron Microscopy (SEM), Energy-Dispersive X-Ray Spectroscopy (EDXS), X-Ray Fluorescence (XRF), Ellipsometry, Rutherford Backscattering Spectroscopy.

Chemical Analysis Fourier-Transform Infrared Spectroscopy (FTIR), Differential Scanning Calorimetry (DSC), Thermo-gravimetric Analysis (TGA), Gas-Chromatography/Mass-Spectroscopy (GC-MS).

Computer skills

Languages MATLAB, Maple, LaTeX, Igor

Tools Origin, Igor, FilmWizard, Microsoft Office Suite, Adobe Suite

Platforms Mac OS, Windows

Spoken Languages

English **Native**

Spanish **Speaking**: Moderate
Reading: Elementary
Writing: Elementary

Italian **Speaking**: Elementary
Reading: Elementary
Writing: Elementary

Personal Interests

Electronics Design and synthesis of novel materials for IC applications, particularly those leveraging unique nanoscale properties

Energy Nanoscale structures for high-efficiency photovoltaic devices.

Culinary Arts Personal hobby.

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Company Recruitment team
Company, Inc.
123 somestreet
some city

August 14, 2012

Dear Sir or Madam,

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Duis ullamcorper neque sit amet lectus facilisis sed luctus nisl iaculis. Vivamus at neque arcu, sed tempor quam. Curabitur pharetra tincidunt tincidunt. Morbi volutpat feugiat mauris, quis tempor neque vehicula volutpat. Duis tristique justo vel massa fermentum accumsan. Mauris ante elit, feugiat vestibulum tempor eget, eleifend ac ipsum. Donec scelerisque lobortis ipsum eu vestibulum. Pellentesque vel massa at felis accumsan rhoncus.

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Sincerely,

Brian Beatty

Enclosure: Curriculum Vitæ