

# RAYMOND FULLON

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## EDUCATION

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### RUTGERS UNIVERSITY, College of Engineering

Ph.D. in Materials Science and Engineering

**2013-Present**  
New Brunswick, NJ

- GPA: 3.66
- Advisor: Manish Chhowalla
- GAANN Fellow

### UNIVERSITY OF TEXAS, College of Natural Sciences

Bachelor of Science in Chemistry with Computation

**2009 – Fall 2012**  
Austin, TX

- GPA: 3.4545
- University Honors

## RESEARCH INTERESTS

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- Novel Applications of exfoliated transition metal dichalcogenides
- Utilizing the phase transition of TMD materials
- Improvement of perovskite-based solar cells
- Solar energy
- Water Splitting
- Semiconductors

## RESEARCH EXPERIENCE

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### Department of Materials Science & Engineering

*The Nanomaterials and Devices Group*

*Graduate Fellow*

**August 2013 - Present**

- Lithium intercalation and exfoliation of transition metal dichalcogenides
- Deposition of transition metal dichalcogenide of various thicknesses onto diverse substrates
- Investigation on the photoelectrochemical applications of transition metal dichalcogenides for the water splitting reaction

### Department of Chemical Engineering

*Undergraduate Researcher in the Mullins Group*

**May 2012 – May 2013**

- Evaluated the changes in solar conversion efficiency as increasing quantities of selenium was added to a BiSI-based solar cell
- Researched the effects of TiO<sub>2</sub> nanoplatelet nanostructures on current density in a photoelectrochemical cell and dye sensitized solar cell using electrochemical methods.
- Investigated the changes in current density and solar cell efficiency of niobium doping in TiO<sub>2</sub> nanowires in a dye sensitized solar cell

## TEACHING LAB

*Undergraduate Student*

**2009 – 2012**

- Organized and performed an independent special research project using fluorimetry to investigate the nitrite content in Spam.
- HPLC, GC-FID, GC-MS, UV-Vis, Fluorimeter, FAAS/ES, CV, and CE

## TEACHING EXPERIENCE

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### Lab I Teaching Assistant

**Spring 2014**

- Managed two lab classes with 12 students.
- Directed students in diverse lab experiments that involved good lab etiquette, lab safety, solution preparation, ceramics testing and experimental note taking.
- Corrected and assigned grades to typed full scientific 5 page lab reports.

### New-Jersey Governor's School of Engineering & Technology: The Hydrogen Economy

**Summer 2014**

- Lead a summer lab session in the synthesis and processing of graphene oxide aerogels.

## PUBLICATIONS

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- Sean P. Berglund, Son Hoang, Ryan L. Minter, **Raymond R. Fullon**, C. Buddie Mullins, "Investigation of 35 Elements as Single Metal Oxides, Mixed Metal Oxides, or Dopants for Titanium Dioxide for Dye-Sensitized Solar Cells" *The Journal of Physical Chemistry C*. **117**, 25248-25258 (2013)
- Son Hoang, Sean P. Berglund, **Raymond R. Fullon**, Ryan L. Minter, and C. Buddie Mullins, "Low temperature hydrothermal synthesis of vertically aligned TiO<sub>2</sub> nanoplatelet arrays for solar energy conversion applications," *Journal of Materials Chemistry A* **1 (13)** 4307-4315 (2013)
- Son Hoang, Thong Q. Ngo, Sean P. Berglund, **Raymond R. Fullon**, Ryan R. Minter, John G. Ekerdt, and C. Buddie Mullins, "Improvement of dye sensitized solar cells with Nb-incorporated hierarchical TiO<sub>2</sub> micro-spheres," *ChemPhysChem* **14 (10)**, 2270-2276 (2013)
- Nathan T. Hahn, Alexander J. E. Rettie, Susanna K. Beal, **Raymond R. Fullon**, and C. Buddie Mullins, "n-BiSI thin films: Selenium doping and solar cell behavior," *The Journal of Physical Chemistry C*. **116**, 24878-24886 (2012)

## PRESENTATIONS

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**Ta-Doped TiO<sub>2</sub> Nanoplatelets for Photoelectrochemical Water Splitting** **Fall 2012**  
University of Texas at Austin – Physical Chemistry II

**Metal Oxides for Photoelectrochemical Water Oxidation** **Fall 2012**  
University of Texas at Austin – Undergraduate Research Focus Group.

**Quantification of Nitrite Ions in Spam through Fluorescence Quenching** **Spring 2012**  
University of Texas at Austin – Advanced Analytical Chemistry

## FELLOWSHIPS/SCHOLARSHIPS

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- **Graduate Assistance in Areas of National Need (GAANN) Fellowship** **2013 - 2015**  
Awarded ~\$32,000 maximum stipend
- **Non-Resident Tuition Exemption (NRTE)** **2009 - 2012**  
Awarded ~\$11,200/year
- **Undergraduate Research Fellowship** **Fall 2012**  
Awarded \$1,000

## SKILLS

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- **Computer** : Microsoft Office: Word, Excel, PowerPoint, Outlook, and Publisher  
Adobe: Photoshop, Premiere Pro, and After Effects
- **Programming**: Java, Python, JavaScript, SQL, CSS, and XHTML
- **Data Processing** : Origin, and imageJ

### Technical Skills

- Spectroscopy: SEM, Raman, Infra-Red, UV-Visible, Photoluminescence, X-Ray Diffraction, Energy Dispersive X-Ray Spectroscopy
- Synthesis: Hydrothermal, Solvothermal, Spray Pyrolysis, CVD
- Electrochemistry: LSV, CV, Chronoamperometry, IPCE, AQE, EQE
- Basic organic synthesis, solution preparation and glove box technique