Wesley K. Tatum

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PhD candidate focused on materials characterization for optoelectronic devices and analysis automation with machine learning methods. Has a passion for clean energy, thin film technologies, and how data science methods can realize these goals more quickly.

- Proficient in many chemical, material, and electronic characterization techniques
- Extensive microscopy experience (SPM and SEM)
- At the intersection of data science and clean energy materials research
- Passionately involved in leadership positions and diversity organizations

Professional Experience

University of Washington Seattle, WA **2015 – Present**

PhD in Materials Science and Engineering with a concentration in Data Science Cumulative GPA: 3.83

Research focused on π-conjugated polymers and the relationship between nano-scale morphology and device performance, crystallization, and developing data science tools to augment clean energy research. Actively involved in registered student organizations. Mentor to more than 15 undergraduate and master's researchers, with as many as 4 teams of 2-4 students at a time.

Research Intern Tempe, AZ **2014 - 2015**

Summer REU at Arizona State University through the National Nanotechnology Infrastructure Network. Researched pyrolytic deposition of iron oxide thin films for photovoltaic materials. Responsible for experimental design and implementation, analysis of samples and data. Presented research at end of summer as seminar, in addition to a poster presentation.

Civic Engagement (selected)

Seattle, WA/ Guatemala University of Washington **2018 – 2020**

Co-founded and elected Lead Officer role in a student organization to research sustainable and resilient micro-grids in Guatemala called Global Renewables Infrastructure Development (GRID). Spear-headed team selection, group structuring, planning and goal-setting for the whole group and sub-teams. Identified interested groups and offices on campus and coordinated efforts to work towards establishing generalizable framework for student-led solarization efforts. Lead meetings, interfaced with local business partners, coordinated and led installation of solar modules on 2 trips to parts of Guatemala. Also planned and moderated a panel discussion on resilient energy at the UW Seattle campus, including UW researchers and RISE researchers from across the country. Presented research results by GRID at the RISE national conference.

Seattle, WA/Jayuya, Puerto Rico University of Washington **2017 - 2020**

Leadership role in a volunteer effort to help Puerto Rico in the aftermath of Hurricane Maria. This effort aims to analyze the energy demands and production opportunities in isolated, mountain cities, specifically Jayuya. The emphasis of this project is to help those whose lives rely on medical devices that require electricity (insulin refrigerators, oxygen concentrators, etc.) and how renewable energy and microgrids can be used to build resilience to natural disasters.

Seattle, WA University of Washington **2016 - 2020**

Elected as officer of the Diversity In Clean Energy (DICE) student group in 2017-2020. Lead Officer 2018-2019. This group aims to increase diverse representation in STEM by hosting career talks, workshops and networking events, and fostering mentorship between clean energy researchers/employees and students. Personal responsibilities included: Planning and organizing events for as many as 250 people, meeting and inviting speakers for monthly talks and panels, running meetings, delegating responsibilities to other officers, interfacing with the Clean Energy Institute and other organizations, moderating panels and workshops.

Publications (selected)

- **Tatum, Wesley K.**; Resing, Anton B.; Flagg, Lucas Q.; Ginger, David S.; Luscombe, Christine K. Defect Tolerance of π-Conjugated polymers and their relevance to optoelectronic applications. *ACS. Appl. Polym. Mat.*, **2019**, 1 (6), 1466-1475.
- Keerthisinghe, Chanaka; Ahumada-Paras, Mareldi; Pozzo, Lilo D.; Kirschen, Daniel S.; Pontes, Hugo; **Tatum, Wesley K.**, Matos, Marvi A. PV- Battery Systems for Critical Loads During Emergencies: A Case Study from Puerto Rico After Hurricane Maria, *IEEE Power and Energy Magazine*, **2019**, 17 (1), 82-92.
- Shi, Qinqin; **Tatum, Wesley K.**; Zhang, Junxiang; Scott, Colleen; Luscombe, Christine K; Marder, Seth R.; Blakely, Simon B. The Direct Arylation Polymerization (DArP) of Well-Defined Alternating Copolymers Based On 5,6-Dicyano[2,1,3]benzothiadiazole (DCBT). *Asian J. of Org. Chem.*, **2018**, 7 (7), 1419-1425.
- **Tatum, Wesley K.**; Luscombe, Christine K. π-Conjugated polymer nanowires: advances and perspectives towards effective commercial implementation. *Polym. J.*, **2018**, 50 (8), 659-669.
- Li, Yilin; **Tatum, Wesley K.**; Onorato, Jonathan W.; Zhang, Yongcao; Luscombe, Christine K. Low elastic modulus and high charge mobility of low-crystallinity indacenodithiophene-based semiconducting polymers for potential applications in stretchable electronics. *Macromolecules*, **2018**, 51 (16), 6352-6358.

- Xi, Yuyin; Li, David S.; Newbloom, Greg M.; **Tatum, Wesley K.**; O'Donnell, Matthew; Luscombe, Christine K.; Pozzo, Lilo D. Sonocrystallization of conjugated polymers with ultrasound fields. *Soft Matter*, **2018**, 14 (24), 4963-4976.
- Li, Yilin; **Tatum, Wesley K.**; Onorato, Jonathan W.; Barajas, Sierra D.; Yang, Yun Y.; Luscombe, Christine K. An indacenodithiophene-based semiconducting polymer with high ductility for stretchable organic electronics. *Polym. Chem.* **2017**, 8 (34), 5185-5193.

Presentations (selected)

- Resilience In Sustainable rEconstruction (RISE), "Photovoltaic Systems for Initial Electrification of Rural and Agricultural Communities of Guatemala", Albany, New York. Poster **2019**
- International Meeting on Information Display (IMID), "Designing High Ductility Polymers for Stretchable Electronics", Busan, Korea. Invited speaker **2018**
- International Workshop on Next Generation Solar Cells, "Designing High Ductility Polymers for Stretchable Electronics", Daejon, Korea. Invited speaker **2018**
- Materials Science and Engineering Industry Day, "MANA-T: Predicting Device Scale Morphology and Performance", Seattle, Washington. Oral presentation **2017**
- Materials Science and Engineering Industry Day, "Solvent Effects on π-Conjugated Polymer Selectivity in Organic Nanowire Self-Assembly", Seattle, Washington. Poster **2016**

Awards & Certificates

Materials Science & Engineering Department Chair's Award **2019**
- An award that recognizes one graduate and one undergraduate student every year for academic excellence, societal engagement, and commitment to enhancing diversity in the department.

Husky 100 **2019**
- An annual award at the UW that recognizes 100 students across all campuses who are making the most of their time at the UW. Husky 100 awardees demonstrate a discovery mindset, commitment to inclusive community, capacity for leadership, an ability to connect the dots, and being ready for what is next.

Nominee for the UW Graduate School Medal **2019**
- Nominated by the Department of Materials Science & Engineering.

Clean Energy Institute Outreach Award **2019**
- An annual award for CEI students that demonstrate commitment to outreach and education in the world around them.

Materials Science & Engineering Department Teacher's Assistant Award **2019**
- Voted by the Junior class as TA of the year. This TA-appointment was for grading and lecturing in Quiz Sections for the MSE Thermodynamics course.

DIRECT Trainee **2017**
- Awarded funding and training through NSF NRT program Data Intensive Research Enabling Clean Technology (DIRECT). Studied and implemented software engineering and data science techniques in the context of clean energy research.

NCAA All-American Scholar Athlete **2014, 2015**
- An award that signifies participation in the NCAA DIII Swimming National Competition, in combination with academic excellence. Undergraduate

NCAA All-American Scholar Athlete: Honorable Mention **2012, 2013**
- An award that signifies qualification for the NCAA DIII Swimming National Competition, in combination with academic excellence. Undergraduate

Education & Athletics

Whitworth University Spokane, WA **2011 – 2015**

Physical Chemistry (B.S.) and Physics (B.A.) Cumulative GPA: 3.61 *cum laude*
- Accepted with honors as a dean's list student. Elected as captain on varsity Men's Swim team, All-American, Academic All-American.

NCAA Division III Swimming Accomplishments:

All-American **2015**
- Placed 8th in the 100 fly and 10th in the 200 fly at NCAA Division III National Championships.

All-American Honorable Mention **2014, 2015**
- Placed 9th in the 200 fly and 10th in the 100 fly at NCAA Division III National Championships.