Corbin Taylor

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Astronomy Ph.D. Candidate, Data Analyst, and Programmer

Email: cjtaylor2390@gmail.com
LinkedIn: https://www.linkedin.com/in/corbin-taylor/
GitHub: https://github.com/cjtaylor1990
Webpage: https://www.astro.umd.edu/∼cjtaylor/

Education

University of Maryland College Park, MD
Ph.D. Candidate Astronomy *2013-2020*

- Specialized in computational Black Hole Astrophysics and Cosmology.

University of Toledo Toledo, OH
B.S. Astrophysics & B.S. Pure Mathematics *2008-2013*

- Cumulative GPA: 3.81
- Graduated Magna Cum Laude with Physics Departmental Honors

Skills

- **Programming & Markup**: **Python (SciPy, NumPy, Matplotlib)**, **C++**, C, HTML, CSS, Javascript, and IDL.
- **Version Control & Automation**: **Git (GitHub, GitLab)**, Bash scripting, and Slurm.
- **Operating Systems**: **OS X**, Unix/Linux, and Microsoft Windows.
- **Leadership & Communication**: Proficient in **project planning, task delegation, and collaborative problem solving**. Experience with public speaking and mentoring.

Work Experience

University of Maryland - Department of Astronomy Jun 2014 - Present
Graduate Research Assistant

- Researched the properties of supermassive black holes and the Milky Way using computer simulations.
- Independently wrote scientific simulation and analysis software using **Python** and **C++**.
- Utilized **SciPy** and **NumPy** libraries to manipulate and analyze large data sets (up to **∼1 Tb**).
- Created automation scripts using Slurm and Bash to utilize the Deepthought 2 (U of Maryland) and Odyssey (Harvard) clusters, running jobs across $\mathbf{10^3}$ **processors**.
- Used algorithmic thinking and creative problem solving to maximize program efficiency, **decreasing both run-time and memory usage by up to a factor of $\mathbf{10^3}$ for $\sim \mathbf{10^{10}}$ entries**.
- Collaborated with **20+ scientists in the US and Europe** in research, paper publication, and scientific software development.
- Presented my work at **12 professional conferences and universities in the US and Europe**.
- Independently prepared and published three scientific papers in major professional journals (Taylor & Reynolds 2018a,b; Taylor et al. 2016)

Space Telescope Science Institute Jun 2012 - Aug 2012
Summer Research Intern

- **Developed a data reduction and analysis pipeline** for space telescope spectral data using **IDL**.
- Used well-understood **test cases to ensure pipeline fidelity**.
- Measured the properties of gas around galaxies using the Cosmic Origin Spectrograph on the Hubble Space Telescope.

University of Toledo - Department of Physics and Astronomy Jan 2009 - Aug 2013
Undergraduate Research Assistant

- **Cleaned and analyzed observational data** taken by the 10m Hobby-Eberly Telescope.
- Found evidence for lithium production in supernovae by modeling absorption spectra.
- Prepared and published a scientific paper in a major professional journal (Taylor et al. 2012)

Leadership Experience

GRAD-MAP Diversity Program May 2014 - Aug 2017
Team Member

- **Led the preparation and teaching of a multi-day Python workshop.**
- Helped prepare and manage week-long research workshops that helped minority students develop skills necessary for a STEM career.
- Collaborated with minority-serving universities and colleges in Maryland, Virginia, and D.C.

University of Maryland - Department of Astronomy Jan 2017 - Apr 2017
Prospective Student Visit Coordinator

- Led the preparation and execution of departmental visits for 19 potential Astronomy graduate students.
- Recruited, led, and delegated tasks to a planning committee of 10 graduate student volunteers.
- Successfully increased new graduate student recruitment rate by **over 30% compared to previous years**.

University of Maryland - Department of Astronomy Aug 2013 - May 2014
Graduate Teaching Assistant

- Led 50 minute discussions with hands-on demonstrations for two sections once a week with an average of 20-30 students per section.
- Mentored struggling students during and outside of my weekly office hours.
- Graded homework, in-class assignments, and exams in a fair and timely manner.

Select Publications

- Taylor, C. and Reynolds, C.S. 2018b; *X-Ray Reverberation From Black Hole Accretion Disks With Realistic Geometric Thickness*, ApJ, 868, 109
- Taylor, C. and Reynolds, C.S. 2018a; *Exploring The Effects of Disk Thickness On The Black Hole Reflection Spectrum*, ApJl, 855, 120
- Taylor, C.; Boylan-Kolchin, M.; Torrey, Paul; Vogelsberger, Mark; and Hernquist, Lars 2016; *The Mass Profile Of The Milky Way To The Virial Radius From The Illustris Simulation*, MNRAS 461, 3483
- Taylor, C.J.; Richey, A.M.: Federman, S.R.; and Lambert, D.L. 2012; *The $^7Li/^6Li$ Isotope Ratio Near The Supernova Remnant IC 443*, ApJ 750 L15.