Sean B. Ballinger

sean.ballinger@gmail.com

EDUCATION

Massachusetts Institute of Technology Cambridge, MA *Starting September 2016*
Ph.D in Nuclear Science & Engineering

Columbia University New York, NY *May 2016*
B.S. in Applied Physics
Minor in Computer Science

Overall GPA: 3.72, Dean's List
Major GPA: 3.76

Phillips Academy Andover, MA *June 2012*
Honor Roll, 2008–2012

RESEARCH EXPERIENCE

MIT Plasma Science and Fusion Center May – August 2015
Researcher funded by the Columbia University Egleston Scholarship *Cambridge, MA*

- Operated a high-speed camera imaging plasma turbulence in the X-point region
- Created tools in Python to subtract video background, filter image data, and perform Fourier, bicoherence, and correlation analysis
- Gave a Contributed Talk, "Fast Imaging of X-point Turbulence in Alcator C-Mod," at the American Physical Society Division of Plasma Physics (APS-DPP) 2015 conference

General Atomics DIII-D June – August 2014
Department of Energy National Undergraduate Fellow *San Diego, CA*

- Added a feedback plasma control system to a Matlab simulation of the KSTAR tokamak
- Automated the tuning of PID controller gain settings for plasma control systems
- Poster, "Optimizing Plasma Control in Superconducting Tokamaks," received the Outstanding Undergraduate Poster Award at the APS-DPP 2014 conference

Columbia Plasma Physics Laboratory January 2013 – Present
Researcher funded by the Columbia University Egleston Scholarship *New York, NY*

- Machined and assembled parts of a capacitor bank power supply for a magnetic coil
- Created an axisymmetric code in Python to reconstruct the plasma current in the High-Beta Tokamak experiment from magnetic sensor data and eddy current eigenmodes

Stony Brook University MRSEC June – August 2011
High school researcher *Stony Brook, NY*

- Characterized the effect of a gold nanoparticle catalyst for hydrogen fuel cell stacks
- Named a semifinalist in the 2011 Intel Science Talent Search competition

WORK EXPERIENCE

NASA Ames Research Center June – August 2013
Intern funded by New York Space Grant *Moffett Field, CA*

- Created fluid simulations of the D8 "Double Bubble" aircraft concept
- Validated the new Launch Ascent and Vehicle Aerodynamics fluid code with wind tunnel simulations
- Used Star-CCM+, Pointwise, and Overflow; ran simulations on NASA's Pleiades supercomputer
- Wrote a 10-page report and gave a closing talk to the department

AWARDS

- National Science Foundation Graduate Research Fellowship Honorable Mention, 2016
- APS-DPP Outstanding Undergraduate Poster Award, 2014
- Robert Gross Scholarship in Applied Physics, 2014–16
- NASA Aeronautics Scholarship Undergraduate Awardee, 2013–15
- Columbia University Egleston Research Scholar, 2012–16
- Intel Science Talent Search Semifinalist, 2012
- National Merit Scholarship Finalist, 2012
- Massachusetts Regional Science Bowl Semifinalist, 2012

COURSEWORK AND SKILLS

Physics and Mathematics	Quantum Mechanics, Plasma Physics, Partial Differential Equations, Applied Electrodynamics, Thermodynamics, Mechanics, Electrical Engineering, Making and Breaking Codes, Statistics
Computer Science	Advanced Programming (C, C++), Data Structures in Java, Computer Science Theory
Programming	C, C++, Python, iOS Objective-C, Java, JavaScript, Bash, LaTeX, HTML, CSS
Software	Matlab, Mathematica, Autodesk Inventor, Star-CCM+, Pointwise
Hardware	Arduino, Raspberry Pi, breadboards, soldering, welding

FOREIGN LANGUAGES

Speak, Read, Write	French, Italian, Spanish, German
Speak, Read	Turkish, Japanese

ACTIVITIES

- **Columbia Undergraduate Science Journal:** Editor in Chief (2015–16), Associate Editor (2012–15)
- **Columbia Portal Project:** Leading the development of a platform for distributed collaborative art around Columbia (present)
- **Society of Physics Students:** Member (2012–present)
- **Euler Friends:** Math circle dedicated to solving Project Euler problems (2012–14)

LINKS

- Projects and papers: http://**sball.in**
- Bio: http://engineering.columbia.edu/**sean-ballinger**
- GitHub: http://github.com/**sballin**
- LinkedIn: http://linkedin.com/in/**seanballinger**