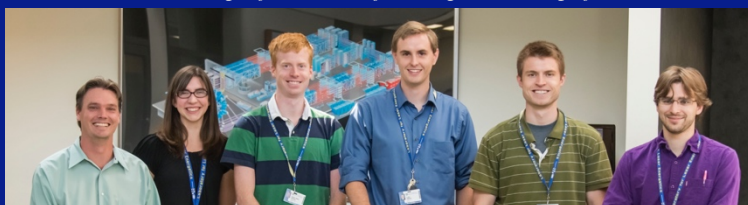


Advisors, Prof. Dustin Froula and Dr. Dan Haberberger

Dr. Andrew Davies received his Ph.D. in Plasma Physics from the University of Rochester's Physics Department in 2019. He started his physics journey at St. Cloud State University and graduated Summa Cum Laude with a Bachelor of Science degree in Astrophysics. He joined the Plasma & Ultrashort Physics Group at the University of Rochester after receiving the Frank J. Horton Fellowship in 2013. Dr. Davies published 11 articles, including first authored Physical Review Letters, Plasma Physics and Controlled Fusion, and Review of Scientific Instruments while he was a graduate student. His thesis work was performed at the Laboratory for Laser Energetics under the direction of Dr. Dan Haberberger and Professor Dustin Froula.

His work focused on ultrafast electron plasma wave dynamics, thermodynamics, and collisions as fundamental processes in laser-plasma physics. He used a novel Thomson scattering technique to obtain unprecedented temporal resolution of the Thomson spectra, which provided a measurement of collisional electron plasma waves that were modeled to extract the picosecond evolution of the electron temperature and density. This revealed a transition in the plasma wave dynamics from an initially cold, collisional state to a quasi-stationary, collisionless state. These picosecond electron temperature and density measurements can be applied to laser-plasma devices that require knowledge of the rapidly evolving plasma conditions, such as a Raman plasma amplifier. These results indicate that the rapidly evolving conditions would result in a strong detuning that would limit the performance of laser-plasma amplifiers.



Dustin Froula, Amanda Davis, Robert Henchen, Collin Stillman, Ross Follett, Andy Davies (2014)



Brian Davies, Suzanne Davies, Andrew Davies, April Wang, Emma Ma



Aaron Hansen, Philip Franke, Dustin Froula, Andy Davies, Sarah Bucht, Jessie Shaw, Dan Haberberger, Avi Milder, Joe Katz, Dana Edgell

Thesis Defense

Dr. Andrew Davies
11 November 2019

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