

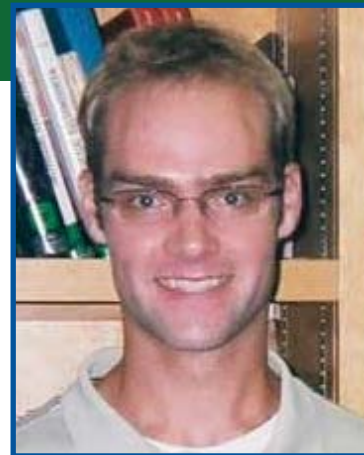
# David James Stark

**Graduate Institution:** The University of Texas - Austin

**Graduate Discipline:** Plasma Physics

**Hometown:** Lakeville, MN

**Relevant SC Research:** Fusion Energy Sciences



## Research Interest:

My research is in the field of quantum plasmas. The particles in these systems have de Broglie wavelengths comparable to the interparticle spacing, so quantum mechanical effects contribute to the collective behavior of the plasma. Currently I am using a quantum fluid model to explore how particle spins can affect electrostatic waves in the plasma.

In the future I am interested in studying relativistic quantum systems such as electron-positron plasmas. Specifically, quantum electrodynamical effects such as pair production/annihilation, scattering, and self-energy need to be incorporated into a model's equations in a tractable manner. A more comprehensive and versatile model of a relativistic quantum plasma could give insight into laser-plasma interactions and ultradense stellar systems.

## About Me:

I have just completed my second year of graduate study at the University of Texas where I work in the Institute for Fusion Studies. I really enjoy the environment of academia with its emphasis on learning and discovery, so I would like to remain in this setting and eventually become a research professor. I also have had very positive teaching experiences, and this career would allow me to work with students while still maintaining my research.

As an undergraduate at the University of Minnesota I majored in physics, astrophysics, and mathematics. My undergraduate research experiences were primarily in astrophysics, including an internship at the Harvard-Smithsonian Center for Astrophysics where I constructed a fluid model of the radio jet in nearby galaxy Centaurus A. I had the

chance to try something different in my internship at the Cornell Laboratory for Accelerator-based Sciences and Education where I simulated different designs of superconducting radio frequency cavities. I presented my Centaurus A research at the 213th American Astronomical Society meeting, and I look forward to future opportunities to interact with other members of the scientific research community.

In my free time, I try to get outside to play tennis. After moving to Austin, I joined a league and have been gradually acclimating to playing matches in the Texas heat. I also enjoy reading fiction and watching movies.



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