



* (to basic research in
Materials Science
and Chemistry)

**Needs
You!**

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*** Openings for new grad students**

• **Muonium as light Hydrogen**

($\text{Mu} = \mu^+e^-$)

($\text{H} = p^+e^-$)

✓ **Mu vs. H atom Chemistry:**

gases, liquids & solids

Best test of reaction rate theories.

Study "unobservable" H atom reactions.

Discover new radical species.

✓ **Mu vs. H in Semiconductors:**

Until recently, μ^+SR gave the only data on
metastable H states!

✓ **Quantum Diffusion:** test theory.

μ^+ in metals (compare H^+)

Mu in nonmetals (compare H)

• The **Muon** as a **Probe**

✓ **Probing Magnetism:** unequalled sensitivity

Local fields: electronic structure; ordering

Dynamics: electronic, nuclear spins

✓ **Probing Superconductivity:**

(especially High T_c)

Coexistence of Superconductivity & Magnetism *

Magnetic Penetration Depth & Coherence Length *

✓ **Probing Charge Transport:**

Delayed Mu Formation reveals electron mobility *