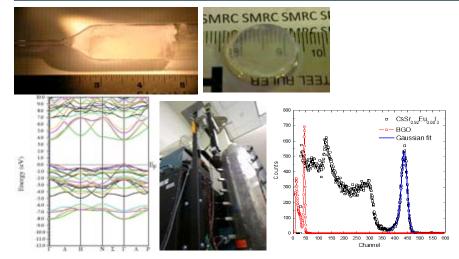
Crystal Growth of Scintillators: Understanding Defects and Dopants

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Existing Collaborations

- Sigma-Aldrich: raw materials quality
- LLNL: valence state of luminescence centers
- Siemens Medical Solutions, Molecular Imaging

Broader Impact

- Pertaining to the basic societal issues of healthcare, security, and energy
- Developing a new graduate course "Scintillation materials and methods for their synthesis"
- Addressing the shortage of students entering careers in crystal growth

Proposed Research Project

- Fundamental study of defect formation during crystallization of new inorganic radiation detectors,
- 2. Effect of defects on: a) scintillation processes, b) physical properties,
- 3. Compensation and/or elimination of defects by co-dopants

Milestones

- 1) EXPERIMENTAL
- Crystal growth: via the Bridgman method
- Characterization: optical, scintillation (thermoluminescence) and physical (hygroscopicity, fracture toughness)
- 2) THEORETICAL
- DFT calculations of the electronic energy level perturbations caused by defects and dopants