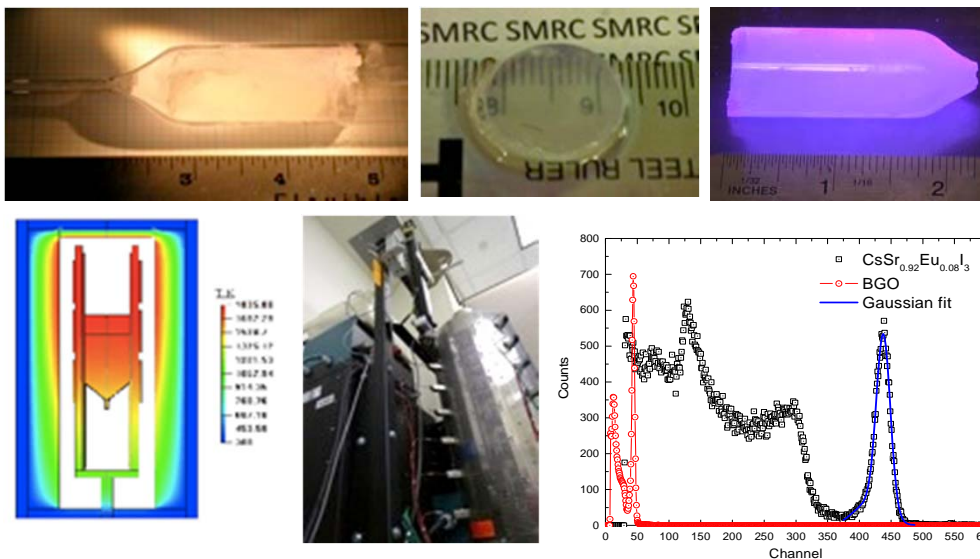


Large Scale Crystal Growth of High Resolution Scintillators

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Existing Collaborations

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

Broader Impact

- Benefit to society of enhanced security from nuclear threats; applications in nuclear medicine and geophysical exploration.
- Establishing new “Scintillator Materials” class for MSE and NE graduate students in Spring 2011

Proposed Research Project

- Crystal growth of gamma-ray/neutron sensitive detection material that can achieve <1% energy resolution at 662 keV at RT
- New scintillators recently discovered by our group have the potential to satisfy this need.
- New compositions include $\text{Cs}(\text{Sr},\text{Ba})\text{X}_3:\text{Eu}$, $(\text{K},\text{Cs})\text{CaX}_3:\text{Eu}$ ($\text{X}=\text{Cl}, \text{Br}, \text{I}$), Cs_3CeX_6 , CsCe_2X_7 ($\text{X} = \text{Cl}, \text{Br}$).

Milestones

- materials characterization; raw materials purification;
- orientation-controlled crystal growth; growth simulations;
- physical and scintillation characterization of the crystals; advanced packaging;
- design and construction of large size crystal growth furnace