

RA3: Chemistry in Extreme Environments

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MSEE

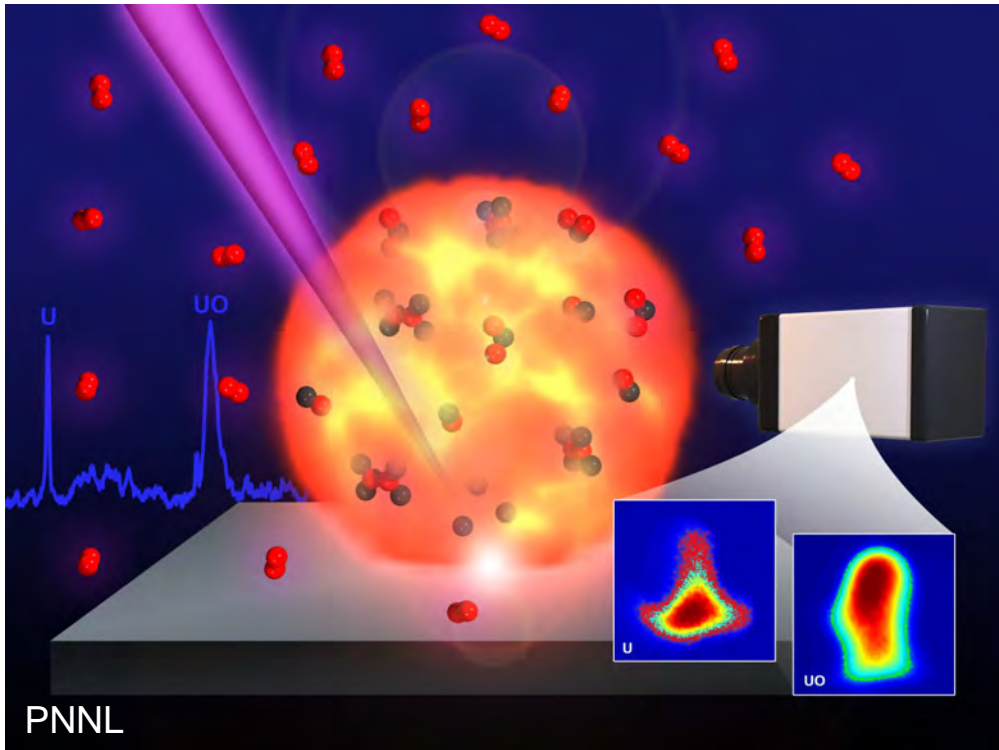
MATERIALS SCIENCE IN
EXTREME ENVIRONMENTS
UNIVERSITY RESEARCH ALLIANCE



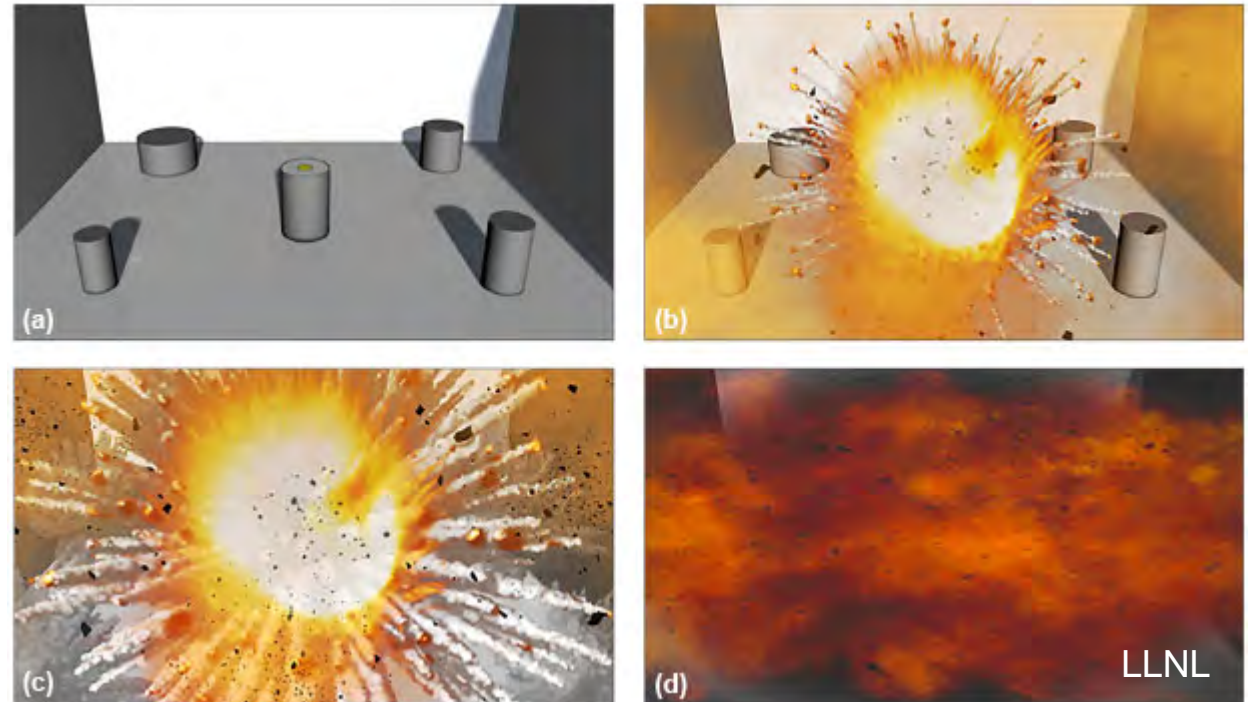


RA3 Focus Areas

- FA1: Nuclear Fireball Plasma Chemistry



- FA2: High Temperature Properties and Chemistry of Agents and Simulants





RA3 Description

- Environments involve high temperatures, elevated pressures, multicomponent chemistry and transport, turbulence, and multiphase flows.
 - Components to be investigated include:
 - **Gas-phase chemical kinetics** leading from atoms to fallout formation, pyrolysis and decomposition of agent in a fireball.
 - **Heterogeneous kinetics:** catalytic agent decomposition, surface reaction on fallout particles; new catalytic materials
 - **Multiphase flow:** transport and mixing of fallout and catalytic particulates; droplet evaporation and breakup; aerosol dynamics.
 - **Advanced diagnostics** to characterize the thermochemical environment in experiments and provide model validation.
 - **Continuum-level modeling** of the complex flow fields.
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RA3 Personnel

RA3-FA1

Investigators and Collaborators	Position	Institution
Daive Curreli	FA Coord	UIUC
Ed Dreizin	PI	NJIT
Nick Glumac	PI	UIUC
Sivanandan Hariral	PI	PNNL
Debbie Levin	PI	UIUC
Mark Phillips	PI	Arizona
Harry Radousky	PI	LLNL
Clare Kimblin	GCAP Collab	STL
Jeff Martin	GCAP Collab	SNL
Timothy Rose	GCAP Collab	LLNL
Villa-Aleman	GCAP Collab	SRNL
Kim Knight	Collaborator	LLNL
Brian Barnes	Collaborator	CCDC ARL
Mark Foster	Collaborator	JHU
Gena Miloshevsky	Collaborator	VCU
Tim Mueller	Collaborator	JHU
Mike Shields	Collaborator	JHU
Mike Zachariah	Collaborator	UCR
Dave Peterson	Collaborator	DTRA

RA3-FA2

Investigators and Collaborators	Position	Institution
Hergen Eilers	FA Coord	WSU
Ed Dreizin	PI	NJIT
Nick Glumac	PI	UIUC
Suresh Menon	PI	GIT
Mark Phillips	PI	Arizona
Raj Sinha	PI	CRAFT Tech
Tim Weihs	PI	JHU
Brian Barnes	Collaborator	CCDC ARL
Mark Foster	Collaborator	JHU
Lori Groven	Collaborator	SDSMT
Tim Mueller	Collaborator	JHU
Mike Shields	Collaborator	JHU
Bryan Wong	Collaborator	UCR
Jeff Davis	Collaborator	DTRA



RA3 connections to other RAs (from IPP)

