Welcome to BOUT++ Workshop

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Lawrence Livermore National Laboratory

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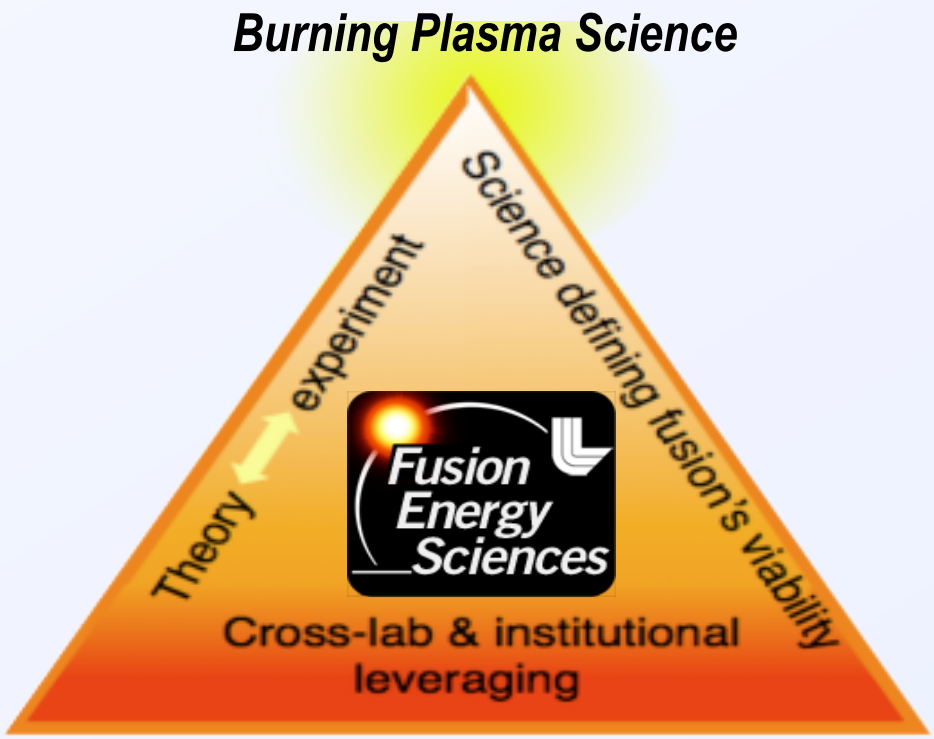
LLNL's Fusion Energy Sciences Program (FESP) is dedicated to advancing the science required for fusion's viability



FESP research activities (experiments, theory, and modeling) include

- **Magnetic fusion energy (MFE) science**
- **High-Energy-Density Laboratory Plasmas (HEDLP) including Heavy Ion Fusion and Fast Ignition**
- **Fusion materials and technology**

Lawrence Livermore National Laboratory

Office of Science

DOE Office of Science Programs at Lawrence Livermore National Laboratory

Fusion Energy Sciences (FES) - Don Correll [e-mail] [bio]
DOE - Fusion Energy Science (FES)

Fusion Energy Sciences Program Mission

The Fusion Energy Sciences Program (FESP) advances interdisciplinary science and technology in areas central to establishing the scientific basis of magnetic and inertial fusion energy.

LLNL's Fusion Energy Sciences Program (FESP) currently covers a broad range of research activities (experiments, theory, and modeling) in (1) magnetic fusion energy (MFE) science; (2) high energy density laboratory plasmas (HEDLP) including inertial fusion energy (IFE) science; and (3) fusion technology and materials.

LLNL FESP's fusion energy activities funded by the DOE/Office of Science - Fusion Energy Sciences are organized along the following lines:

- MFE Experimental Collaborations
- Fusion Theory and Computations
- HEDLP/IFES: Fast Ignition Research
- HEDLP/IFES: Heavy Ion Fusion Science
- Fusion Technology and Materials

Fusion Energy Sciences at LLNL

Don Correll is the Point-of-Contact for DOE Office of Science Programs - Fusion Energy Sciences (FES) at LLNL.

http://fusion-energy.llnl.gov

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Fusion Energy Sciences (FES)

Home

http://science.energy.gov/fes/

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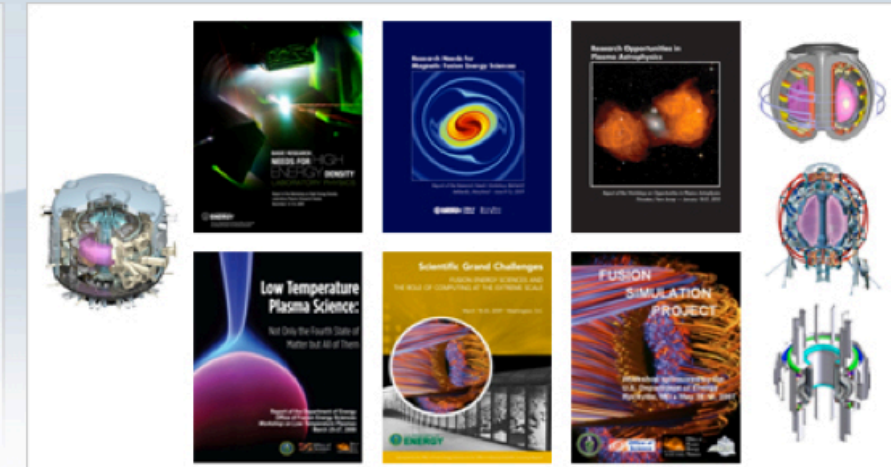
Fusion Energy Sciences

Plasma science forms the basis for research that is needed to establish our ability to harness the power of the stars in order to generate fusion energy on earth. The research required for fusion energy's success is intimately tied to rich scientific questions about some of nature's most extreme environments, inside and outside of stars, and has practical implications to industry beyond energy as well.



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The pursuit of fusion energy embraces the challenge of bringing the energy-producing power of a star to earth for the benefit of humankind. The promise is enormous—an energy system whose fuel is obtained from seawater and from plentiful supplies of lithium in the earth, whose resulting radioactivity is modest, and which yields zero carbon emissions to the atmosphere. The pursuit is one of the most challenging programs of scientific research and development that has ever been undertaken. With the support of FES, a devoted, expert, and innovative scientific and engineering workforce has been responsible for the impressive progress in harnessing fusion energy since the earliest fusion experiments over sixty years ago. As a result, we are on the verge of a new age in fusion science during which researchers will undertake fundamental tests of fusion energy's viability. Establishing a deep scientific understanding of the requirements for harnessing and optimizing this process on earth is critical, and the progress has been dramatic.

CONTACT US

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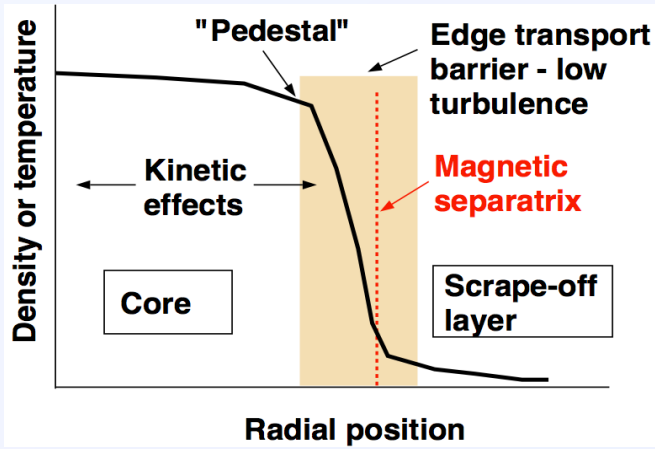
BOUT++ workshop http://bout2011.llnl.gov
September 14 – 16, 2011

- The workshop goals:
  - to prepare researchers to use and further develop the BOUT++ code for edge turbulence, transport, and ELM simulations of magnetic fusion devices; and
  - to promote effective collaboration within the BOUT community and beyond.

- There are 49 registered attendees from five countries: China, PRC (6), Japan (2), Korea, ROK (5), UK (2) and USA (34)



IOP Publishing and International Atomic Energy Agency — Nuclear Fusion
Nucl. Fusion 51 (2011) 000000 (10pp) — UNCORRECTED PROOF

Nonlinear ELM simulations based on a nonideal peeling–ballooning model using the BOUT++ code

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BOUT++ workshop planning has benefited from many individuals

Organizing Committee

Xueqiao Xu (Chair, LLNL, USA)

Ben Dudson (U. York, UK)

Maxim Umansky (LLNL, USA)

Sean Farley (ANL/IIT, USA)

Scientific Committee

Howard Wilson (Chair, U. York, UK)

Lois Curfman McInnes (Argonne National Laboratory, USA)

Phil Snyder (General Atomics, USA)

Francois Waelbroeck (IFS, U Texas, USA)

Xueqiao Xu (Lawrence Livermore National Laboratory, USA)

- **Received strong support from administrative team**
  - **Irene Massiatt et al.**
- **Received strong support from LLNL computing**
  - **David Smith**
- **Received strong NIF computer support**
  - **Robert Akins**

Job Description

Job Title: POSTDOCTORAL RESEARCH STAFF MEMBER

Job ID: 10250

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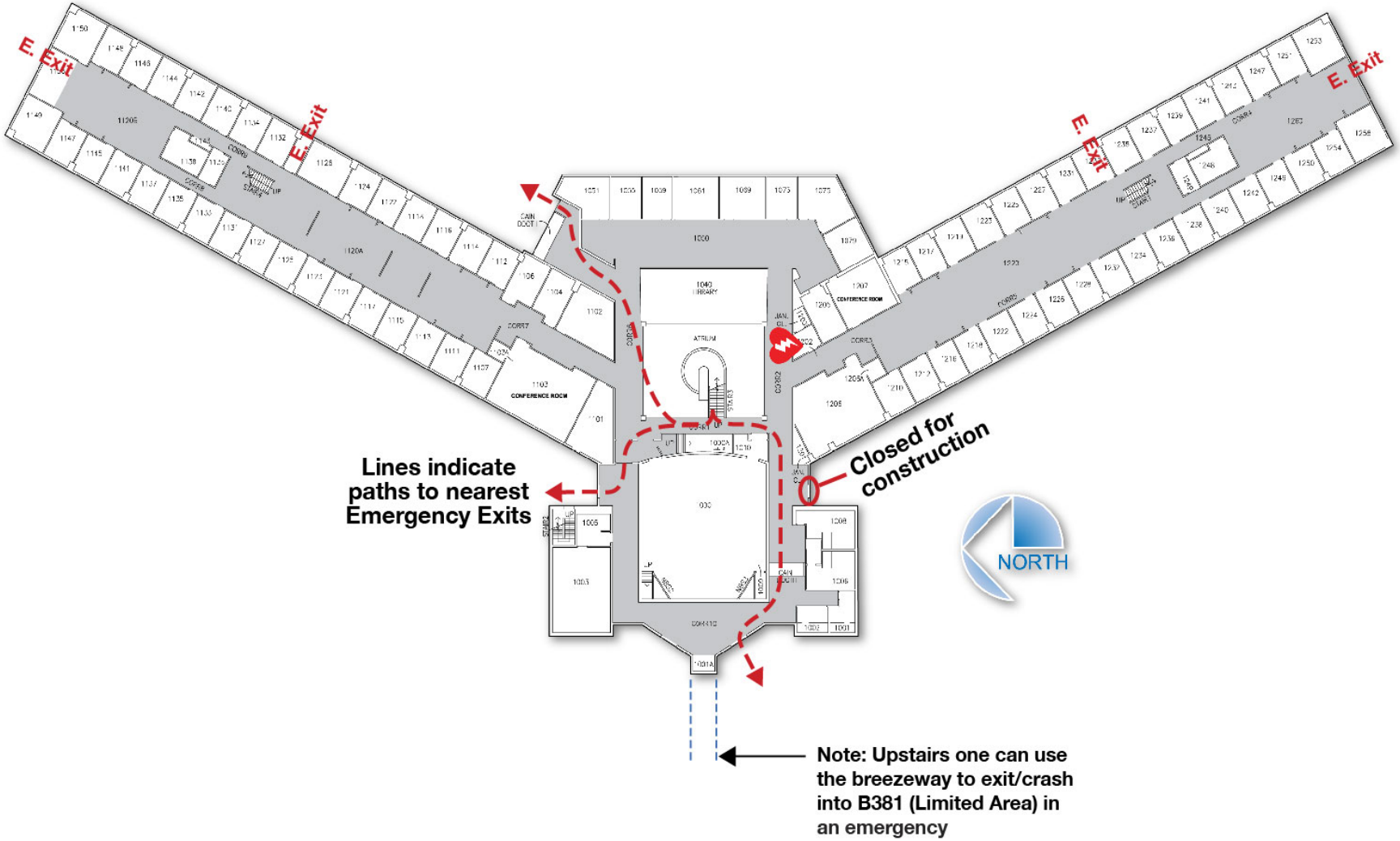
https://careers.llnl.gov/

NOTE: This is a two-year Postdoctoral appointment with the possibility of extension to a maximum of three years. For important information about LLNL appointments refer to the FAQs above. Eligible candidates are recent PhDs within five years of the month of the degree award at the time of employment offer.

The Physics Division within the Physical and Life Sciences Directorate has an immediate opening for a theoretical Postdoctoral Research Staff Member in the theory and simulation of magnetic-fusion-energy devices. The research includes working with a team to model and predict the physics in the edge region of magnetic fusion devices, in particular tokamaks. The selected candidate's specific responsibilities will be the new development and application of a gyro-fluid simulation code for transport and turbulence in edge plasmas. The work will be performed within the LLNL Theory/Computational group. Will interact with physicists in China and South Korea working in the EAST and KSTAR super-conducting tokamak research programs. Will report to the Principal Investigator for this project and the Associate Program Leader for Theory and Computation in the Fusion Energy Sciences Program.

ESSENTIAL DUTIES
- Participate in development of a new edge gyrofluid code in C++ language
- Implement new gyrofluid physics models and design gyrofluid algorithms

Building 481 First Floor Emergency Exits

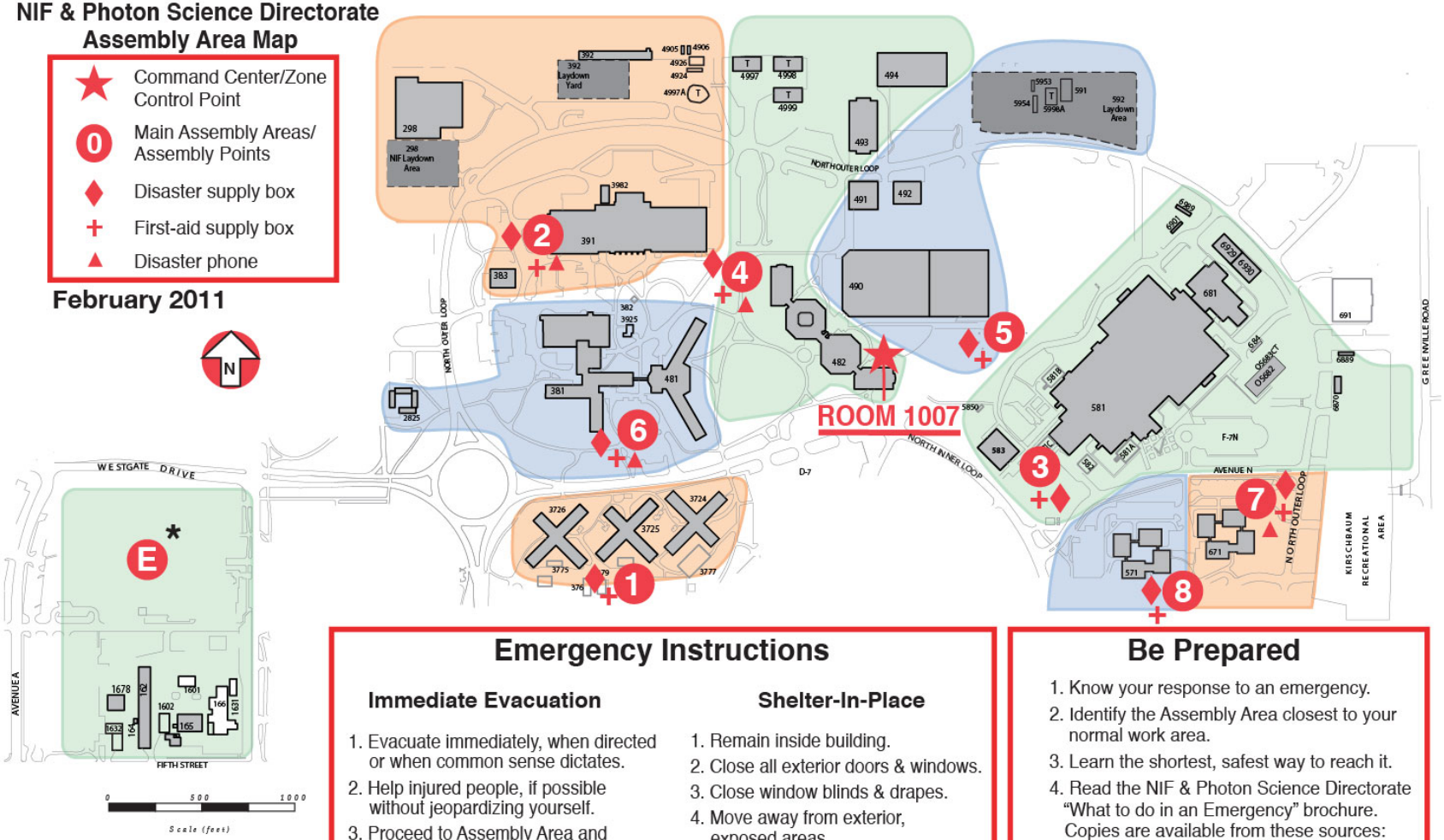


Where to go in an Emergency

NIF & Photon Science Directorate Assembly Area Map

- Command Center/Zone Control Point
- Main Assembly Areas/ Assembly Points
- Disaster supply box
- First-aid supply box
- Disaster phone

February 2011



*** Non NIF & PS Assembly Area**

Emergency Instructions

Immediate Evacuation

1. Evacuate immediately, when directed or when common sense dictates.
2. Help injured people, if possible without jeopardizing yourself.
3. Proceed to Assembly Area and await additional instructions.
4. Report any injuries or unsecured classified materials, etc.

Shelter-In-Place

1. Remain inside building.
2. Close all exterior doors & windows.
3. Close window blinds & drapes.
4. Move away from exterior, exposed areas.
5. Follow instructions over building page system.

Be Prepared

1. Know your response to an emergency.
2. Identify the Assembly Area closest to your normal work area.
3. Learn the shortest, safest way to reach it.
4. Read the NIF & Photon Science Directorate "What to do in an Emergency" brochure. Copies are available from these sources:
   NIF & Photon Science Directorate
   - ES&H Office (ext. 2-2272)
   - Self Help Coordinator (ext. 3-3077)
   - TeamNIF internal website under Facilities and Assurances/ES&H https://nif-int.llnl.gov/

NIF employees working in non NIF & Photon Science Directorate Facilities should report to the nearest assembly area.