

# Accelerator and Detector Simulations

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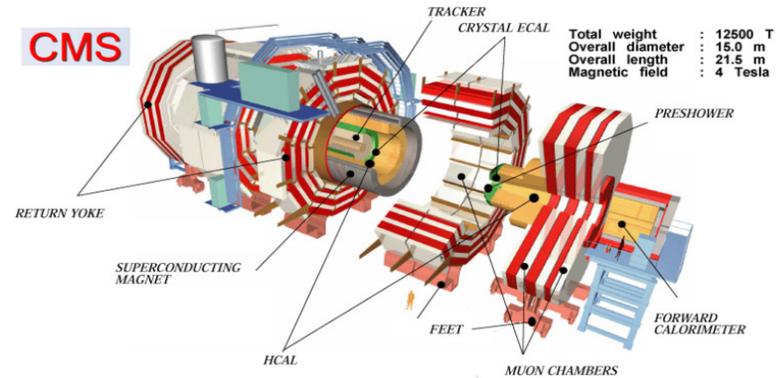
# ADS Mission Statement

- The mission of the Accelerator and Detector Simulation Department/FNAL CD is to take responsibility in national and international simulation projects for critical contributions by providing leadership, scientific knowledge and technical expertise to the FNAL ILC detector design teams, in the accelerator modeling community, the CMS LHC Physics Center and as members of the Geant4 collaboration. Our significant skills in C++ and other programming languages provides, advances and improves code bases used for simulation and other endeavors.
- We contribute to the on-going scientific programs of the laboratory including CMS and Run II and the FNAL neutrino program by providing support and expertise to those communities by providing a library of certified generated events, as well as participating directly in physics analysis.

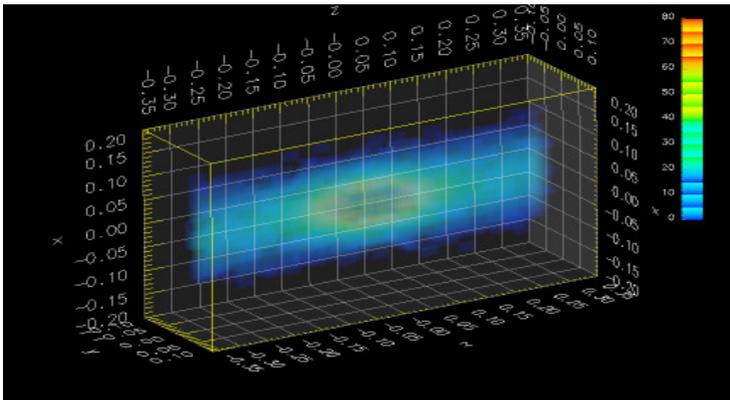
# Simulation Focal Areas



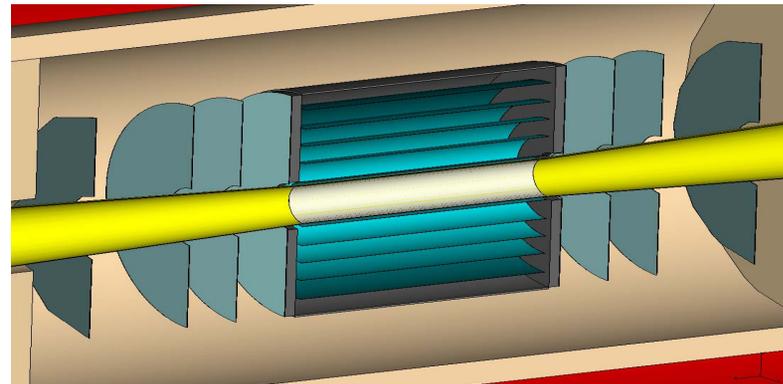
**Physics Generators**



**CMS**



**Accelerator Modeling**

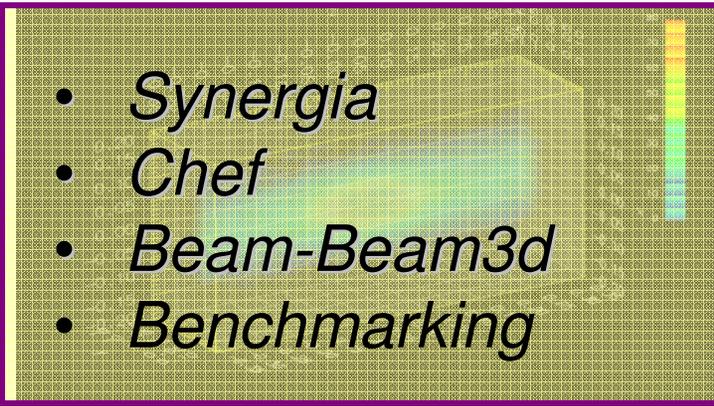


**ILC detector optimization**

# ADS Projects & Tools

- 
- *Pythia*
  - *Patriot*
  - *Data/Monte Carlo tuning*

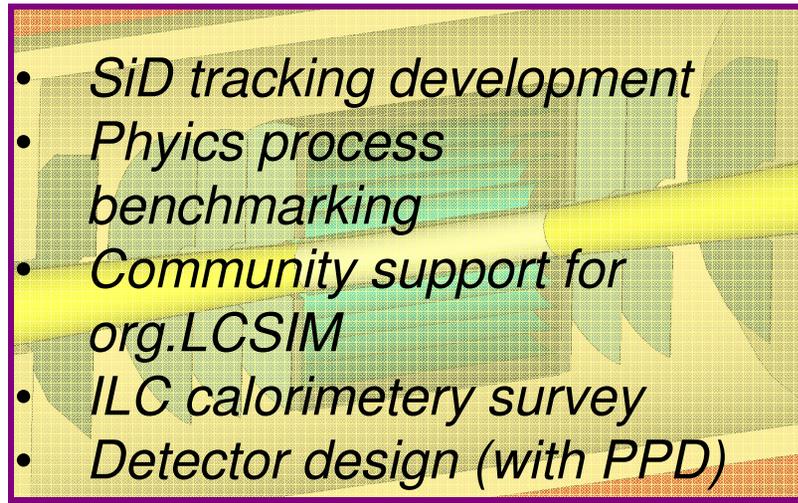
## **Physics Generators**

- 
- *Synergia*
  - *Chef*
  - *Beam-Beam3d*
  - *Benchmarking*

## **Accelerator Modeling**

- 
- *CMS Simulations & Software Validation (CMS Framework/EDM)*
  - *LPC Leadership & participation*
  - *GEANT 4 collaboration*
    - *Technical performance*
    - *Hadronic shower parameterization*

## **Detector Simulation**

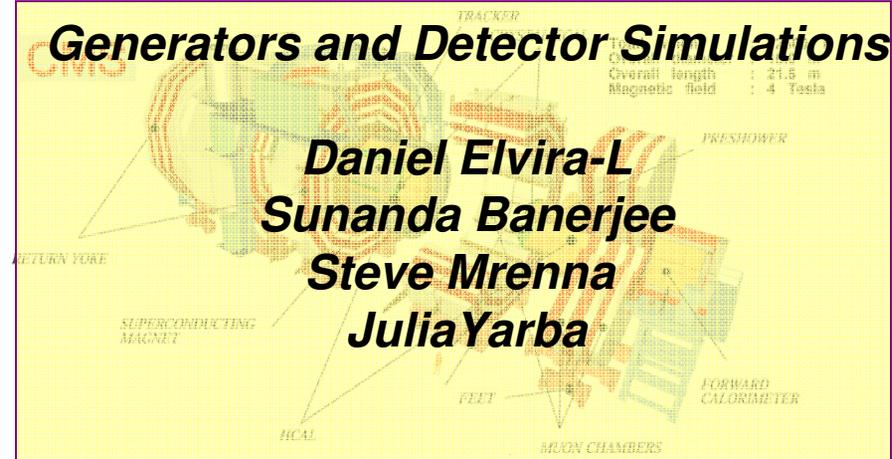
- 
- *SiD tracking development*
  - *Physics process benchmarking*
  - *Community support for org.LCSIM*
  - *ILC calorimetry survey*
  - *Detector design (with PPD)*

## **ILC detector optimization**

# People

**Computational Physics for  
Accelerators**  
**Panagiotis Spentzouris-L**  
**James Amundson**  
**Doug Dechow**  
**Valentin Ivanov**  
**Paul Lebrun**  
**Leo Michelotti**  
**Eric Stern**

## **Generators and Detector Simulations**



## **ILC Detector Simulation**

**Mark Fischler-L**  
**Lynn Garren**  
**Jim Kowalkowski**  
**Rob Kutschke**  
**Adam Para**  
**Marc Paterno**  
**David Sachs**  
**Hans Wenzel**  
**G.P. Yeh**

# Contributions and Collaborations

- Accelerator modeling - SciDAC
- Lattice QCD
- LHC Physics Center
- GEANT 4 collaboration
- C++ International Standards Body
- FNAL ILC Working Groups
- Experiment collaborators