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## The LHC Theory Initiative

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L.H. Orr (Rochester)

- this talk: brief overview of 2005 LHC-TI activities
- next talk: outline of 2005 NSF proposal (**Lynne Orr**)
- third talk: summary of response to proposal (**Sekhar Chivukula**)
- open discussion, Q&A

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- What is the LHC Theory Initiative?

- ☞ There is a mismatch between the need for theorists doing work that connects directly with experiment in the US, and the number of theorists doing such work
- ☞ Funding agencies have invested large sums in the LHC; a modest additional investment in relevant theory can have a large physics payoff
- ☞ Stronger connections between model building, speculative theory, and traditional phenomenology are needed
- ☞ **LHC Theory Initiative:** Community-wide effort to strengthen LHC related theory work in the US
- ☞ specifically:
  - stimulate research on projects which enable ATLAS and CMS to fully utilize the physics potential of the LHC

- organize activities such as working groups, workshops, collaborations with experimentalists, etc.
- there appears consensus that this is best done by supporting postdocs, students (not necessarily by creating more positions, but by stimulating them to work on LHC physics), and, if possible, junior faculty
- **therefore:** obtain additional funding from NSF and/or DoE for LHC related theory work
- **timeline:**
  - ☞ March 2004: message from Fred Cooper (NSF program director for Theoretical High Energy Physics) to participants of the KITP collider workshop emphasizing the need of more financial support for LHC related theory and better coordination (“Virtual Phenomenology Institute [VPI]”)
  - August 2004: talk by Fred Cooper on VPI at DPF2004, Riverside

- ➡ Initial message following up Fred's idea sent in January 2005 (UB, L.H. Orr) to community. Positive feedback.
- ➡ February 2005: Brainstorming session at BNL TeV4LHC meeting
- ➡ Organizational meeting May 4, 2005 in Madison; NSF and DoE participate. Decision to write whitepaper to make physics case and submit NSF proposal in Fall 2005

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☞ May-June 2005: LHC-TI steering committee formed. Members:

- Jonathan Bagger (Johns Hopkins)
- Ulrich Baur (Buffalo)
- Sekhar Chivukula (MSU)
- Sarah Eno (Maryland, CMS)
- Walter Giele (FNAL Theory)
- JoAnne Hewett (SLAC)
- Ian Hinchliffe (LBNL)
- Paul Langacker (Penn) [chair]
- Steve Mrenna (FNAL Computing)
- Fred Olness (SMU)
- Lynne Orr (Rochester)
- John Parsons (Columbia, ATLAS)
- Martin Schmaltz (BU)
- Carlos Wagner (Argonne)
- Edward Witten (IAS)

- ☞ June 2005: first Aspen town meeting and “Aspen Consensus”
  - student and postdoc funding of highest priority
  - fellowship structure proposed
  - **S. Chivukula** joins team
- ☞ August 2005: second town meeting in Aspen. First go at Fellowship structure and implementation within a NSF theory grant.
- ☞ September 2005: steering committee decides to propose Fellowships in a subcontract model for postdocs and students with reduced overhead
  - JHU offered a good deal on overhead
  - **J. Bagger** joins team
  - more details from Lynne Orr
- ☞ September 2005: whitepaper completed. Meeting with P. Rosen and PK Williams in Washington

- ☞ October 2005: NSF proposal submitted
  - PI: J. Bagger, Co-PI's: UB, S. Chivukula, L.H. Orr
  - proposal includes 13 letters of support from a variety of institutions (ATLAS, CMS, Harvard, Yale, Wisconsin, FNAL, ANL, Florida, Oklahoma, Berkeley, ...)
- ☞ March 2006: NSF decision not to fund proposal this year
  - more details on response from S. Chivukula
- ☞ April 2006: meeting with J. Dehmer and P. Rosen at NSF to discuss some issues in response to the proposal
  - encouragement from NSF to submit modified proposal this Fall