

BSM Higgs Workshop @ LPC

Organizers

Bogdan Dobrescu - Co-Chair (FNAL)

Christophe Grojean - Co-Chair (IFAE, Barcelona)

Meenakshi Narain - Co-Chair (Brown)

John Stupak - Co-Chair (Purdue Calumet)

Boaz Klima (FNAL)

Sudhir Malik (UPRM)



Meenakshi Narain, Boaz Klima
LHC Physics Center Coordinators

Overview of LPC...



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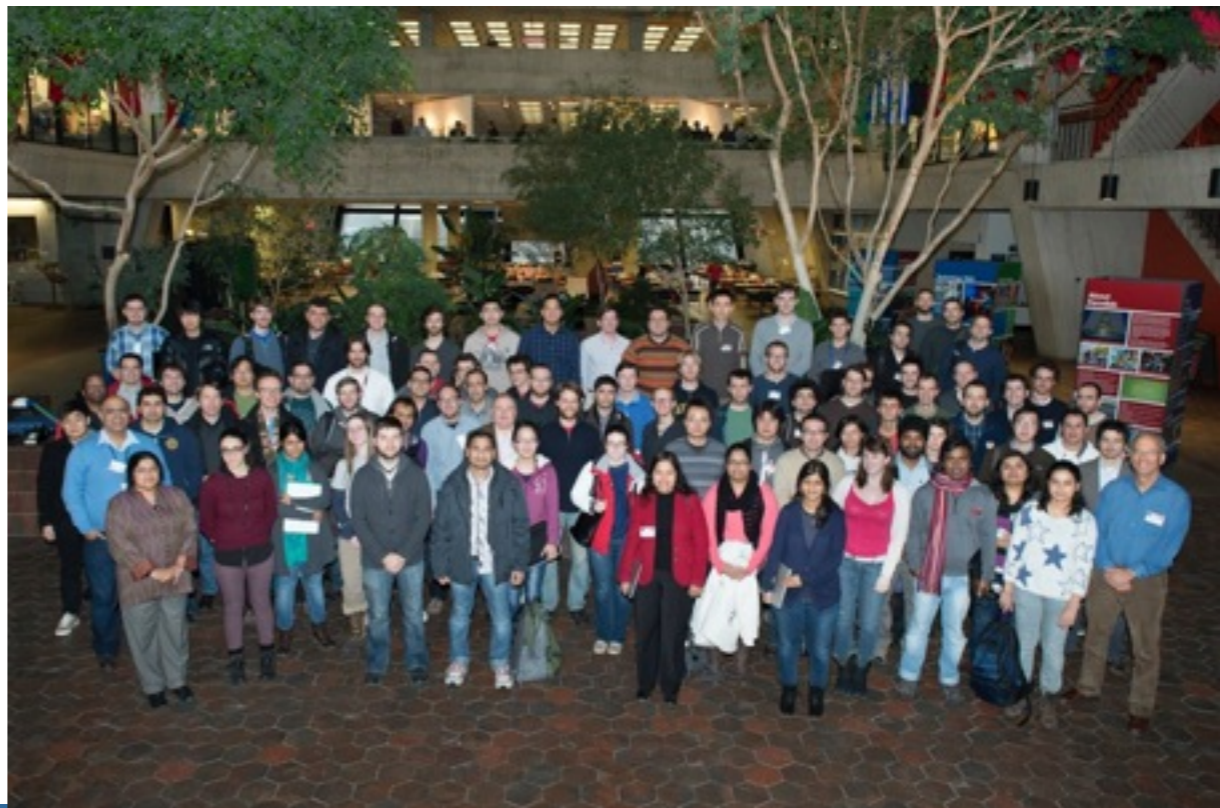
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- Acts as a catalyst for contributions of US CMS Collaborators to the experiment.
 - serves as a critical link for remote physicists to participate directly in the CMS, economically and transparently.
 - LPC serves as a “Meeting Point”, as a resource and physics analysis hub



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 - LPC serves as a “Meeting Point”, as a resource and physics analysis hub
- One of the main focus of the LPC is to start discussions to plan studies for the 2015 run.





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- **Topic of the Week “Seminars”:**
 - to foster interactions between LPC-based experimentalists and the theory community, and to ensure an efficient connection between the LPC and the broader experimental community.
 - Visiting TOTW scientists typically give one or a series of seminars and offer "office hours" for follow-up conversations.



Topic of the Week Seminars

- fosters interactions between LPC-based experimentalists and the theory community
- <http://lpc.fnal.gov/programs/topic/index.shtml>

July 22 at 3 pm	Matt Reece (Harvard)	Natural SUSY's Last Hiding Places	WH11 NE (Sunrise)	54 total (44 CMS)
June 17 at 3 pm	Tim Cohen (SLAC)	Jet Substructure by Accident	WH11 NE (Sunrise)	42 total (38 CMS)
June 5 at 3 pm	Jochen Ott (Hamburg University)	Practical Statistics	WH11 NE (Sunrise)	28 total (28 CMS)
TBD	Giuliano Panico (CERN)	ETBD	WH11 NE (Sunrise)	RESCHEDULED
April 30 at 3 pm	David Curtin (Stonybrook)	SUSY in Standard Model Standard Candles	WH11 NE (Sunrise)	47 total (40 CMS)
April 17 at 4 pm	Greg Landsberg (Brown)	New developments in dark matter searches at colliders - Greg Landsberg (Brown)	WH11 NE (Sunrise)	68 total (59 CMS)
April 15 at 3 pm	Kaustubh Agashe (Maryland)	Using energy-peaks to measure particle (new and old) masses	WH11 NE (Sunrise)	38 total (29 CMS)
March 18 at 3 pm	Rouven Essig (Stonybrook)	Exotic Decays of the 125 GeV Higgs Boson	WH11 NE (Sunrise)	40 total (30 CMS)
March 4 at 3 pm	Sally Dawson (Brookhaven)	Higgs Couplings	WH11 NE (Sunrise)	59 total (49 CMS)
February 18 at 3 pm	Frank Petriello (Northwestern University)	Opportunities in Higgs physics at the LHC Run II	WH11 NE (Sunrise)	54 total (39 CMS)
February 13 at 3 pm	Steven Worm (STFC - Rutherford Appleton Lab.)	The Search for Dark Matter at the LHC	WH11 NE (Sunrise)	49 total (41 CMS)

and many more



CMS LPC Fellows Program

- Flagship of the LPC -- International competition
 - identifies and brings to the LPC, jointly with the university community, exceptional young CMS scientists

some from 2014

& few from 2015

 ALEXEY Ferapontov ... plan to focus on searches for Supersymmetry signatures with low missing transverse energy ("Stealth SUSY") that contain a large number of jets ...	 SADIA Khalil ... using these boosted boson/top tagging techniques in both SUSY RPV and RPC searches for natural stops in collaboration with LPC SUSY group. I also like to contribute to CMS pixel simulation as phase 1 upgrade program...
 HONGXUAN Liu ... work on searches for new physics in the all-hadronic channel. My primary focus will be improvement of the all-hadronic direct stop search and new searches covering the compressed spectrum. In addition, I will continue my work on the Combined Forward Calorimeter for the HCAL PhaseII upgrade....	 MARTIJN Mulders ... As co-convenor of the CMS Top physics group I will oversee the completion of the legacy publications based on the 7 and 8 TeV datasets, and prepare for data taking and physics analysis at higher energy in 2015...
 GREG Landberg ... Physics Coordinator of the CMS experiment in 2012-2013; main interests span Higgs physics and searches for new phenomena....	 NHAN Tran ... understanding of advanced jet techniques for a broad range of physics applications. Jets very rich and complicated objects and probing their structure improves our knowledge of
 SANJAY Padi ... plan to explore and develop tools and techniques for searches of SUSY with Higgs in the final state (in the gaugino/higgsino sector)...	

 MAURIZIO Pierini ... preparing for Run II within PPD, analysis in EXO and SUSY, finishing the studies we started in Run I and preparing the Run II analysis campaign ...	 HONGXUAN Liu ... improve the top tagger used in the 8 TeV analysis, use the top tagger for gluino-mediated stop production and direct stop production covering topologies with different branching fraction of the stop decays ...
 JOHN Stupak ... exploiting jet substructure techniques in the boosted regime of associated Higgs production to reduce these backgrounds, improve the sensitivity, and firmly establish the decay to b quarks ...	

 GABRIELE Benelli ... enabling LPC residents to get involved in critical operations and calibration activities, training the future Strip tracker expert generation necessary to strengthen the Tracker project and ensure its continued successful operation ...	 GIUSEPPE Cerati ... focus on the analysis of same-sign dilepton events with Run 2 data and improve the sensitivity of CMS analyses in this final state ...
 SOUVIK Das ... leading searches for Higgs boson pair production in 13 TeV data ...	 PHILLIP Dudero ... searches for Heavy Higgs, and electroweak multiboson production and scattering in the semileptonic channel with searches for anomalous gauge couplings ...
 DANIEL Duggan ... leading the upgrade effort for the online DQM framework in preparation for Run II, including the development of an interface to the new file-based data acquisition system ...	 SADIA Khalil ... VLQ searches in single production channel with focus on bottom like heavy quarks and searches with SUSY models with low missing transverse energy ...





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Poster for the 2014 CMS LPC Fellows Program. It features a grid of 10 fellow profiles, each with a photo, name, and a brief description of their work. The profiles are arranged in two columns. The names and descriptions are as follows:

- FERAPONTOV**: ... plan to focus on searches for Supersymmetry signatures with low missing transverse energy ("Stealth SUSY") that contain a large number of jets ...
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LPC BSM Higgs Workshop

- With the discovery of the Higgs boson, we are in a new era: we now have a theory that can be extrapolated to scales many orders of magnitude beyond those that we can currently directly probe.
- The Higgs sector, being particularly sensitive to new physics, provides an excellent probe of BSM effects.
- Our aim is to bring together the experimental and theoretical communities to discuss these topics, and develop new strategies to exploit the Higgs sector as a probe of new physics during Run 2.
- On behalf of the LPC, we welcome all the participants and are happy to provide the support to host this three day gathering, to discuss the current experimental status, discussion of ideas for future measurements, searches, and theoretical directions and their implications for Run 2.

Format of the workshop

- The workshop is structured, but presentations are supposed to be informal and “interruptible”
 - Feel free to ask questions throughout the talks
- Planned discussions at the end of each day and the workshop.
- In order to encourage questions and comments during the talks we have included a 5-minute "discussion period" after each talk.
- a note to speakers: please upload your slides on Indico at least a few hours before your talk.



Practical Information

- Registration right outside
- Coffee breaks : just outside this room
- Lunch : may be bought in the cafeteria
 - Important - lunch services stop at 1:30 pm
- Reception: Monday, Nov 3, 6:30-8:30 pm.
- Workshop Dinner: Tuesday Nov 4, 7 pm
 - Masala (<http://www.masalachicago.com>)
 - please sign up at <http://doodle.com/5ssg3wab93g9bnhv>
 - in case of questions, please contact John Stupak
- Group photo: Tuesday, Nov 4, at 3:15 pm
- Wi-Fi: can connect to the 'guest' access point:
 - Guests should select the "guest" network and will be redirected to the guest registration page after registration expires at midnight each day. On subsequent days, they must re-register.

Many Thanks to

- the URA Scholars program
- the Fermilab Conference office staff:
 - Cynthia Sazama, Suzanne Weber,
 - Melody Saperston
- the LPC admin staff:
 - Terry Grozis, Carrie Farver,
 - Terry Read, Sonya Wright
- the organizers:
 - Bogdan Dobrescu, Christophe Grojean,
 - John Stupak, Sudhir Malik