Welcome to the 2nd ECFA HL-LHC Experiments Workshop at Aix-les-Bains

As for 2013, the bulk of the material has been organised by Preparatory Groups, but with the focus on technologies rather than sub-detector systems to emphasise further the synergies between experiments and R&D collaborations

PG1: Physics theory, physics experiment, performance

PG2: Solid state tracking detectors

PG3: Scintillating devices

PG4: Gaseous detector systems (incl micro-pattern)

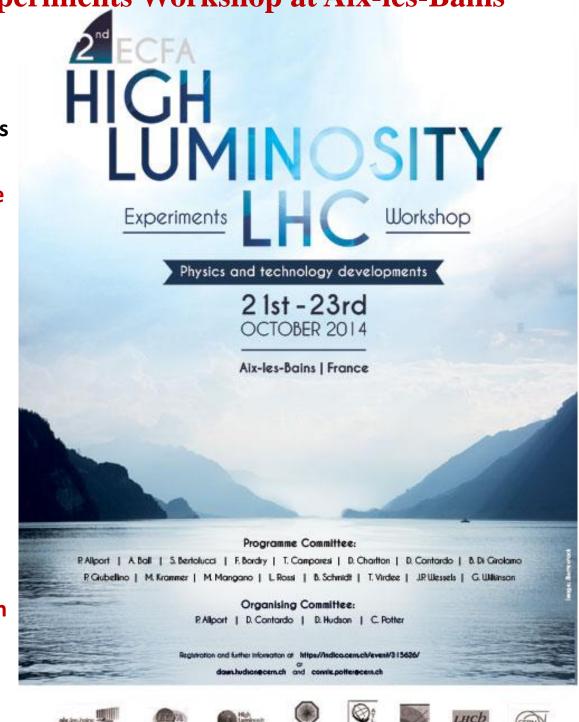**PG5: Electronics systems (ASIC - HDI - HBW links - powering scheme - power supply - modular electronics & xTCA)**

PG6: Mechanics and cooling

PG7: Trigger, online and offline computing

PG8: Accelerator and experiment interface, activation and mitigation

The sessions are chaired by the PG Convenors and many thanks are due to all who participated in the work of the PGs and to all contributors

2nd ECFA HIGH LUMINOSITY LHC Experiments Workshop

Physics and technology developments

21st - 23rd OCTOBER 2014

Aix-les-Bains | France

Programme Committee:

P. Allport | A. Ball | S. Bertolucci | F. Bordry | T. Camporesi | D. Charlton | D. Contardo | B. Di Girolamo
P. Giubellino | M. Krammer | M. Mangano | L. Rossi | B. Schmidt | T. Virdee | J.P. Wessels | G. Wilkinson

Organising Committee:

P. Allport | D. Contardo | D. Hudson | C. Potter

Registration and further information at https://indico.cern.ch/event/315626/
or
dawn.hudson@cern.ch and connie.potter@cern.ch

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Welcome to the 2nd ECFA HL-LHC Experiments Workshop at Aix-les-Bains

The agenda for the October 2013 1st ECFA HL-LHC Experiments Workshop at Aix-les-Bains is linked at http://indico.cern.ch/conferenceDisplay.py?confId=252045 with write up also at http://cerncourier.com/cws/article/cern/55887

The report from this to ECFA can be found at https://cds.cern.ch/record/1631032 (ECFA-13-284)

ECFA/13/284

ECFA High Luminosity LHC Experiments Workshop:
Physics and Technology Challenges

Report submitted to ECFA

Prepared from inputs provided by the ALICE, ATLAS, CMS and LHCb Collaborations

21st November 2013

D. Abbaneo, M. Abbrescia, P.P. Allport, C. Amelung, A. Ball, D. Barney, C. F. Bedoya, P. De Barbaro, O. Beltramello, S. Bertolucci, H. Borel, O. Bruning , P. Buncic, C. M. Buttar, J.P. Cachemiche, P. Campana, A. Cardini, S. Caron, M. Chamizo Llatas, D. G. Charlton, J. Christiansen, D. C. Contardo, G. Corti, C. G. Cuadrado, A. Dainese, B. Dahmes, B. Di Girolamo, P. Dupieux, P. Elmer, P. Farthouat, D. Ferrere, M. Ferro-Luzzi, I. Fisk, M. Garcia-Sciveres, T. Gershon, S. Giagu, P. Giubellino, G. Graziani, I. M. Gregor, B. Gorini, M. Hansen, C.S. Hill, K. Hoepfner, P. Iengo, J. Incandela, M. Ishino, P. Jenni, A. Kluge, P. Kluit, M. Klute, T. Kollegger, M. Krammer, N. Konstantinidis, O. Kortner, G. Lanfranchi, F. Lanni, R. Le Gac, R. Lindner, F. Machefert, M. Mangano, M. Mannelli, V. Manzari, A. Marchioro, S. McMahon, I.-A. Melzer-Pellmann, S. Mersi, P. Braun Munzinger, W. J. Murray, S. Myers, A. Nisati, N. Neufeld, P. Phillips, D. Pinci, K. Prokofiev, C. Rembser, P. Riedler, W.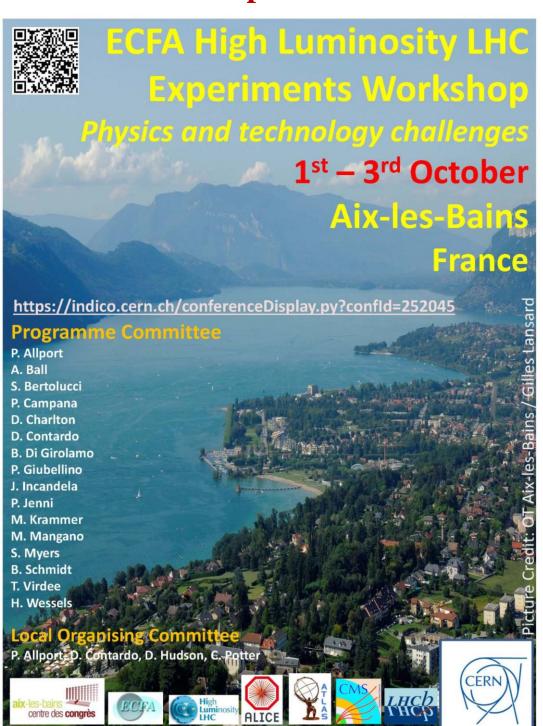 Riegler, J. Rojo, L. Rossi, D. Rousseau, A. Safonov, G. P. Salam, A. Sbrizzi, C. Schaefer, B. Schmidt, C. Schwick, D. Silvermyr, W. H. Smith, A. Valero, P. Vande Vyvre, F. Vasey, S. Veneziano, B. Verlaat, T.S. Virdee, A.R. Weidberg, A. Weiler, P. Wells, H. Wessels , G. Wilkinson, K. Wyllie, W. Zeuner

ECFA Report on the Physics Goals and Performance Reach of the HL-LHC *

D. Abbaneo, M. Abbrescia, P. P. Allport, C. Amelung, A. Ball, D. Barney, C. F. Bedoya, P. De Barbaro, O. Beltramello, S. Bertolucci, H. Borel, O. Bruning , P. Buncic, C. M. Buttar, J.P. Cachemiche, P. Campana, A. Cardini, S. Caron, M. Chamizo Llatas, D. G. Charlton, J. Christiansen, D. C. Contardo, G. Corti, C. G. Cuadrado, A. Dainese, B. Dahmes, B. Di Girolamo, P. Dupieux, P. Elmer, P. Farthouat, D. Ferrere, M. Ferro-Luzzi, I. Fisk, M. Garcia-Sciveres, T. Gershon, S. Giagu, P. Giubellino, G. Graziani, I. M. Gregor, B. Gorini, M. Hansen, C.S. Hill, K. Hoepfner, P. Iengo, J. Incandela, M. Ishino, P. Jenni, A. Kluge, P. Kluit, M. Klute, T. Kollegger, M. Krammer, N. Konstantinidis, O. Kortner, G. Lanfranchi, F. Lanni, R. Le Gac, R. Lindner, F. Machefert, M. Mangano, M. Mannelli, V. Manzari, A. Marchioro, S. McMahon, I.-A. Melzer-Pellmann, S. Mersi, P. Braun Munzinger, W. J. Murray, S. Myers, A. Nisati, N. Neufeld, P. Phillips, D. Pinci, K. Prokofiev, C. Rembser, P. Riedler, W. Riegler, J. Rojo, L. Rossi, D. Rousseau, A. Safonov, G. P. Salam, A. Sbrizzi, C. Schaefer, B. Schmidt, C. Schwick, D. Silvermyr, W. H. Smith, A. Valero, P. Vande Vyvre, F. Vasey, S. Veneziano, B. Verlaat, T.S. Virdee, A.R. Weidberg, A. Weiler, P. Wells, H. Wessels , G. Wilkinson, K. Wyllie, W. Zeuner

The workshop conclusions were presented to the 21/11/13 Plenary ECFA at CERN and at the SPC meeting of 10/12/13

ECFA High Luminosity LHC Experiments Workshop

Physics and technology challenges

1st – 3rd October

Aix-les-Bains France

https://indico.cern.ch/conferenceDisplay.py?confId=252045

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Local Organising Committee
P. Allport, D. Contardo, D. Hudson, E. Potter

Picture Credit: OT Aix-les-Bains / Gilles Lansard

2013 Agenda

Tuesday, 1 October 2013

09:00 - 10:00 Registration and welcome coffee

10:00 - 13:15 Workshop Opening
Conveners: Prof. Philip Patrick Allport (University of Liverpool (GB)), Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR))

- **10:00** **European Strategy and goal of the workshop** *10'*
  Speaker: Manfred Krammer (Austrian Academy of Sciences (AT))
- **10:15** **The High Luminosity LHC** *25'*
  Speaker: Frederick Bordry (CERN)
- **10:45** **ALICE Upgrade program** *25'*
  Speaker: Werner Riegler (CERN)
- **11:15** **LHCb Upgrade Program** *25'*
  Speaker: Andreas Schopper (CERN)
- **11:45** **ATLAS Upgrade Program** *25'*
  Speaker: Dr. Thorsten Wengler (CERN)
- **12:15** **CMS Upgrade Program** *25'*
  Speaker: Jeffrey Spalding (Fermi National Accelerator Lab. (US))
- **12:45** **CERN perspective** *20'*
  Speaker: Rolf Heuer (CERN)

13:15 - 14:15 Lunch

14:15 - 16:05 Physics Goals, Theoretical developments and performance reach
Conveners: Prof. Chris Hill (Ohio State University (US)), Gavin Salam (C)

- **14:15** **Theory perspective of the HL-LHC** *25'*
  Speakers: Gavin Salam (C), Andreas Weiler (Deutsches Elektronen-Synchrotron (DE))
- **14:45** **Higgs boson precision measurements** *35'*
  Speaker: Bill Murray (STFC - Science & Technology Facilities Council (GB))
- **15:25** **Search for signatures of BSM physics at the HL-LHC with the ATLAS and CMS detectors** *35'*
  Speaker: Isabell Melzer-Pellmann (Deutsches Elektronen-Synchrotron (DE))

16:05 - 16:30 Coffee break

16:30 - 18:00 Physics Goals, Theoretical developments and performance reach
Conveners: Andreas Weiler (Deutsches Elektronen-Synchrotron (DE)), Aleandro Nisati (Universita e INFN, Roma I (IT))

- **16:30** **Requirements from physics to detector and trigger systems at HL-LHC** *25'*
  Speaker: Bryan Dahmes (University of Minnesota (US))
- **17:00** **Heavy Flavour Physics at HL-LHC** *25'*
  Speaker: Marie-Helene Schune (Universite de Paris-Sud 11 (FR))
- **17:30** **Heavy Ion physics prospect at HL-LHC** *25'*
  Speaker: Andrea Dainese (Universita e INFN (IT))

18:00 - 18:30 Accelerator and Experiments Interface - I
Conveners: Maria Chamizo Llatas (Centro de Investigaciones Energ. Medioambientales y Tecn. - (ES), Dr. Christoph Rembser (CERN)

- **18:00** **Special requests during HL-LHC** *20'*
  Speaker: Johannes Peter Wessels (Westfaelische Wilhelms-Universitaet Muenster (DE))

19:00 - 20:00 Reception

9:00 - 09:50 Accelerator and Experiments Interface - II
Conveners: Maria Chamizo Llatas (Centro de Investigaciones Energ. Medioambientales y Tecn. - (ES), Dr. Christoph Rembser (CERN)

- **09:00** **Pile-up at HL-LHC and possible mitigation** *20'*
  Speaker: Stephane Fartoukh (CERN)
- **09:25** **Beam instrumentation, machine and experiment protection** *20'*
  Speaker: Dr. Helmut Burkhardt (CERN)

9:50 - 11:05 Long Shutdown Constraints and Radiation and Activation Effects
Conveners: Olga Beltramello (CERN), Wolfram Zeuner (CERN)

- **09:50** **Activation and radiation issues** *20'*
  Speaker: Olga Beltramello (CERN)
- **10:15** **Infrastructure changes and upgrades** *20'*
  Speaker: Fernando Baltasar Dos Santos Pedrosa (CERN)
- **10:40** **HL-LHC - The challenges in upgrading the experiments** *20'*
  Speaker: Wolfram Zeuner (CERN)

11:35 - 13:05 Electronics and Readout Systems
Conveners: Philippe Farthouat (CERN), Magnus Hansen (CERN)

- **11:35** **Introduction** *5'*
  Speaker: Philippe Farthouat (CERN)
- **11:40** **IC designs and technologies** *20'*
  Speaker: Alessandro Marchioro (CERN)
- **12:05** **Power distribution** *15'*
  Speaker: Peter Phillips (STFC - Science & Technology Facilities Council (GB))
- **12:25** **Modular electronics** *15'*
  Speaker: Jean-Pierre Cachemiche (Centre National de la Recherche Scientifique (FR))
- **12:45** **High speed links** *20'*
  Speaker: Francois Vasey (CERN)

13:10 - 14:00 Lunch

14:00 - 16:00 Tracking Systems and Associated Electronics and Readout
Conveners: Ingrid Gregor (Deutsches Elektronen-Synchrotron (DE)), Duccio Abbaneo (CERN)

- **14:00** **Overview of the Tracker Upgrades** *20'*
  Speaker: Ingrid Gregor (Deutsches Elektronen-Synchrotron (DE))
- **14:25** **Development of Radiation Hard Sensor Material** *20'*
  Speaker: Petra Riedler (CERN)
- **14:50** **Advanced Electronics for Tracking Systems** *20'*
  Speaker: Jorgen Christiansen (CERN)
- **15:15** **Novel technologies and materials for thermal management** *20'*
  Speaker: Bart Verlaat (NIKHEF (NL))
- **15:40** **Summary and Concluding Remarks (Tracking Session)** *10'*
  Speaker: Duccio Abbaneo (CERN)

16:00 - 16:30 Coffee break

16:30 - 18:30 Calorimetry and Associated Electronics and Readout
Conveners: Francesco Lanni (Brookhaven National Laboratory (US)), Marcello Mannelli (CERN)

- **16:30** **Introduction, Overview and physics requirement in phase 1** *25'*
  Speaker: Marcello Mannelli (CERN)
- **17:00** **Calorimetry Electronics** *25'*
  Speaker: Arno Straessner (Technische Universitaet Dresden (DE))
- **17:30** **Calorimeter detectors** *40'*
  Speaker: Pawel De Barbaro (University of Rochester (US))
- **18:15** **Calorimetry: Summary and Conclusion** *10'*
  Speaker: Francesco Lanni (Brookhaven National Laboratory (US))

20:00 - 23:00 Workshop Dinner

Thursday, 3 October 2013

09:00 - 10:40 Muon Systems and Associated Electronics and Readout
Conveners: Marcello Abbrescia (Universita e INFN (IT)), Christoph Amelung (Brandeis University (US))

- **09:00** **New Challenges for Muon Detection and Triggering in the HL-LHC Environment** *20'*
  Speaker: Alexei Safonov (Texas A & M University (US))
- **09:25** **Longevity and Expected Performance of the Existing Muon Systems at the LHC Experiments** *20'*
  Speaker: Paolo Iengo (INFN Napoli (IT))
- **09:50** **Novel Gaseous Detector and Technology R&D** *20'*
  Speaker: Marcello Abbrescia (Universita e INFN (IT))
- **10:15** **Muon detector readout and trigger electronics upgrades for the HL-LHC** *20'*
  Speaker: Masaya Ishino (Kyoto University (JP))

10:40 - 11:10 Coffee break

11:10 - 13:00 Trigger/DAQ/Offline/Computing
Conveners: David Rousseau (LAL-Orsay), Wesley Smith (University of Wisconsin (US))

- **11:10** **Technology Developments for Trigger, Data Acquisition, Software and Computing** *15'*
  Speaker: Niko Neufeld (CERN)
- **11:30** **Trigger and Data Acquisition at the HL-LHC** *30'*
  Speaker: Wesley Smith (University of Wisconsin (US))
- **12:05** **Computing** *20'*
  Speaker: Predrag Buncic (CERN)
- **12:30** **Software** *20'*
  Speaker: David Rousseau (LAL-Orsay)

2014 Agenda

esday, 21 October 2014

0 - 09:00 Registration

0 - 10:30 Opening session
Conveners: Prof. Philip Patrick Allport (University of Liverpool (GB)), Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR))

09:00 **Welcome and introduction** 15'
Speakers: Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR)), Prof. Philip Patrick Allport (University of Liverpool (GB))

09:15 **Accelerator update and CERN perspective** 45'
Speaker: Oliver Bruning (CERN)

10:00 **Coffee** 30'

0 - 12:00 Accelerator and Experiment Interface, Activation and Mitigation
Conveners: Olga Beltramello (CERN), Oliver Bruning (CERN), Dr. Helmut Burkhardt (CERN), Wolfram Zeuner (CERN)

10:30 **LS2 and LS3: The largest Challenges we Know Today** 25'
Speaker: Wolfram Zeuner (CERN)

11:00 **Radiation protection: New Results for LS2 and Beyond** 25'
Speaker: Olga Beltramello (CERN)

11:30 **HL-LHC Work Programme and Scheduling** 25'
Speaker: Mrs. Isabel Bejar Alonso (CERN)

0 - 13:00 Lunch

0 - 14:20 Experiments, scope and R&D goals
Conveners: Prof. Philip Patrick Allport (University of Liverpool (GB)), Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR))

13:00 **ALICE** 15'
Speaker: Werner Riegler (CERN)

13:20 **LHCb** 15'
Speaker: Giovanni Passaleva (Universita e INFN (IT))

13:40 **ATLAS** 15'
Speaker: Ingrid-Maria Gregor (DESY)

14:00 **CMS** 15'
Speaker: Prof. Jeremy Mans (University of Minnesota (US))

0 - 15:00 Physics goals and performance reach
Conveners: Markus Klute (Massachusetts Inst. of Technology (US)), Aleandro Nisati (Universita e INFN, Roma I (IT)), Gavin Salam (CERN), Andreas Weiler (CERN)

14:20 **Pileup Mitigation at the HL-LHC** 15'
Speaker: Pippa Wells (CERN)

14:40 **Forward Detector Performance at the HL-LHC** 15'
Speaker: Lindsey Gray (Fermi National Accelerator Lab. (US))

0 - 15:30 Coffee break

0 - 18:40 Physics goals and performance reach
Conveners: Markus Klute (Massachusetts Inst. of Technology (US)), Aleandro Nisati (Universita e INFN, Roma I (IT)), Gavin Salam (CERN), Andreas Weiler (CERN)

15:30 **Higgs Theory** 15'
Speaker: Christophe Grojean (ICREA/IFAE (Barcelona))

15:50 **Prospects on Higgs Physics at the HL-LHC** 20'
Speaker: Aram Apyan (Massachusetts Inst. of Technology (US))

16:15 **SM Theory** 15'
Speaker: Prof. Nigel Glover (IPPP Durham)

BSM Theory 15'
Speaker: Gilad Perez (CERN & Weizmann)

16:55 **Prospects on Beyond the Standard Model Physics at the HL-LHC** 20'
Speaker: Stephane Willocq (University of Massachusetts (US))

17:20 **Heavy Flavour Theory** 15'
Speaker: Gino Isidori (Istituto Nazionale Fisica Nucleare (IT))

17:40 **Heavy Flavour prospects at the HL-LHC** 15'
Speaker: Vincenzo Vagnoni (Universita e INFN (IT))

18:00 **Heavy Ion Theory** 15'
Speaker: Urs Wiedemann (CERN)

18:20 **Heavy ions at HL-LHC: experimental prospects** 15'
Speaker: Andrea Dainese (INFN - Padova (IT))

18:40 - 20:00 Reception

Wednesday, 22 October 2014

09:00 - 11:05 Solid State Tracking Detectors
Conveners: Frank Hartmann (KIT - Karlsruhe Institute of Technology (DE)), Daniel Muenstermann (Universite de Geneve (CH))

09:00 **Introduction** 10'
Speaker: Daniel Muenstermann (Universite de Geneve (CH))

09:15 **Strip/Pixel Hybrid Sensors** 20'
Speaker: Paula Collins (CERN)

09:40 **MAPS HV/HR-CMOS** 15'
Speaker: Walter Snoeys (CERN)

10:00 **Pixel Electronics and Interconnection** 25'
Speaker: Mauricio Garcia-Sciveres (Lawrence Berkeley National Lab. (US))

10:30 **Challenges and Synergies of silicon sensor for High Granularity Calorimeter** 15'
Speaker: Roger Rusack (University of Minnesota (US))

10:50 **Trends and synergies in solid state tracking R&D** 10'
Speaker: Frank Hartmann (KIT - Karlsruhe Institute of Technology (DE))

11:30 - 12:35 Scintillating Devices
Conveners: Pawel De Barbaro (University of Rochester (US)), James Proudfoot (Argonne National Laboratory (US))

11:30 **Introduction** 5'
Speakers: James Proudfoot (Argonne National Laboratory (US)), Pawel De Barbaro (University of Rochester (US))

11:40 **Scintillating Fibre Tracking** 20'
Speaker: Christian Joram (CERN)

12:05 **Scintillating calorimeter Systems** 30'
Speaker: David Anthony Petyt (STFC - Rutherford Appleton Lab. (GB))

12:30 - 12:55 Liquid Nobel Gas Calorimetry 25'
Speaker: Prof. John P. Rutherfoord (University of Arizona (US))

13:00 - 14:00 Lunch

14:00 - 15:35 Gaseous Detectors
Conveners: Marcello Abbrescia (Universita e INFN (IT)), Oliver Kortner (Max-Planck-Institut fuer Physik (Werner-Heisenberg-Institut) (D))

14:00 **Motivation and role of gaseous detectors at HL-LHC** 10'
Speaker: Christian Lippmann (GSI - Helmholtzzentrum fur Schwerionenforschung GmbH (DE))

14:15 **RPCs for High Radiation Environments** 15'
Speaker: Rinaldo Santonico (Universita e INFN Roma Tor Vergata (IT))

14:35 **Precision Micro-Pattern Gaseous Detectors for Large Areas** 20'
Speaker: Archana Sharma (CERN)

15:00 **Wire Detectors for Triggering and Tracking at HL-LHC** 15'
Speaker: Giacomo Graziani (Universita e INFN (IT))

15:20 **Trends and Synergies in gaseous detectors R&D** 10'
Speaker: Marcello Abbrescia (Universita e INFN (IT))

15:30 - 15:55 Large Area Timing Detectors 25'
Speaker: Tommaso Tabarelli de Fatis (Universita & INFN, Milano-Bicocca (IT))

16:00 - 16:30 Coffee

16:30 - 18:00 Mechanics and Cooling
Conveners: Danilo Giugni (CERN), Paola Tropea (CERN)

16:30 **CO_2 Cooling** 20'
Speaker: Paolo Petagna (CERN)

16:55 **Micro-channel Cooling** 15'
Speaker: Jan Buytaert (CERN)

17:15 **Low Mass Structures** 20'
Speaker: Corrado Gargiulo (CERN)

17:40 **Integration and Environmental Issues** 15'
Speaker: Eric Anderssen (Lawrence Berkeley National Lab. (US))

19:00 - 23:00 Dinner Cruise

Thursday, 23 October 2014

09:00 - 12:00 Electronics Systems
Conveners: Magnus Hansen (CERN), Philippe Farthouat (CERN)

09:00 **Introduction** 5'
Speaker: Philippe Farthouat (CERN)

09:05 **Electronics Requirements for Tracker Upgrades** 20'
Speaker: Alex Grillo (University of California, Santa Cruz (US))

09:30 **Electronics Requriements for Calorimetry Upgrades** 15'
Speaker: Francesco Lanni (Brookhaven National Laboratory (US))

09:50 **Electronics Requirements for Muon System Upgrades** 15'
Speaker: Paul Aspell (CERN)

10:10 **FPGA Use within the Detector Volume** 15'
Speaker: Tullio Grassi (Univ. of Maryland (USA))

10:30 **Coffee** 30'

11:00 **Combined Talk on High Speed Optical and Electrical Links** 25'
Speaker: Paulo Rodrigues Simoes Moreira (CERN)

11:30 **IC Technologies** 25'
Speaker: Michael Campbell (CERN)

12:00 - 13:00 Lunch

13:00 - 15:20 Trigger, Online and Offline Computing
Conveners: Graeme Andrew Stewart (University of Glasgow (GB)), Wesley Smith (University of Wisconsin (US))

13:00 **Level-1 Hardware-based Triggers** 30'
Speaker: Wesley Smith (University of Wisconsin (US))

13:35 **DAQ, Online and Software-based triggers** 30'
Speaker: Vladimir Gligorov (CERN)

14:10 **Computing** 30'
Speaker: Mikolaj Krzewicki (Johann-Wolfgang-Goethe Univ. (DE))

14:45 **Software** 30'
Speaker: Graeme Andrew Stewart (University of Glasgow (GB))

15:20 - 16:00 Concluding talk
Conveners: Prof. Philip Patrick Allport (University of Liverpool (GB)), Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR))

15:20 **Conclusion and discussion** 30'
Speakers: Didier Claude Contardo (Universite Claude Bernard-Lyon I (FR)), Prof. Philip Patrick Allport (University of Liverpool (GB))

Some Practical Points Relating to the Workshop

- **The programme includes a reception here tonight starting straight after the "*physics goals and performance reach*" session**

- **For those who have signed up for tomorrow's dinner the coaches will leave from here for the Aix-les-Bains port area by 19.00 so please arrive at least 15 minutes beforehand. There will be <u>some</u> room on the coaches in both directions for anyone who wishes to eat in the port area but has not signed up to join the cruise**

- **Speakers must upload their talks to the conference web interface at http://congres.aixlesbains.fr at least half a day before the relevant session (instructions circulated by email) and to the conference indico page. The version of the talk that will be used during the session with be the one from the conference web interface. Please, however, ensure that any last minute updates are also propagated to the version in indico, ideally by the end of the day of the session**

- **The conference centre has greatly improved their wireless but there are still limitations in the links from the centre to the outside which mean that downloading of large files from remote locations will cause everyone problems. Therefore the provision of an internal conference web interface at http://congres.aixlesbains.fr has been implemented.**

- **Please follow the instructions on the next slide to access talks either during or after the presentation to be able to go back over the material rather than try to bring the file across from indico. Copies of this slide are also available from the workshop secretariat**

Some Practical Points Relating to the Workshop

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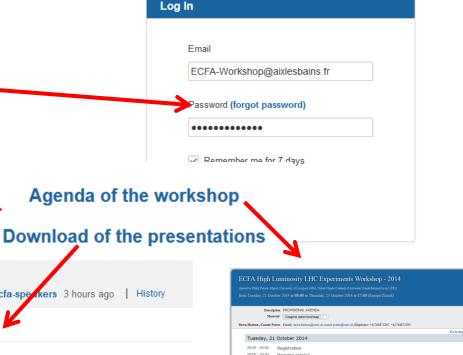
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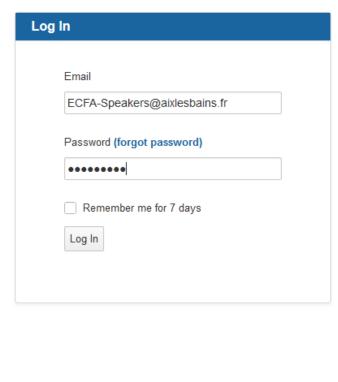- **Then click Download to get to the next screen**

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