

top activities at MPI (Atlas)

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- ▶ Atlas top group at MPI
 - members
 - involvement in Atlas
 - motivation for top physics
- ▶ analysis plans
 - m_{top} in lepton+jets during commissioning phase
- ▶ special expertises we have
 - vertexing, inner detector alignment
 - calorimetry, hadronic energy scale



Atlas top group at MPI ► members

- The Atlas group at MPI Munich used to have 4 separate subgroups
 - HEC: Hadron Endcap Calorimeter
 - MDT: Muon Drift Tubes
 - SCT: Semiconductor Tracker
 - Computing/Core Software
- named after the hardware projects we are involved with
- physics groups are formed with members from all 4 subgroups
- top group members:

PostDocs and senior scientist:

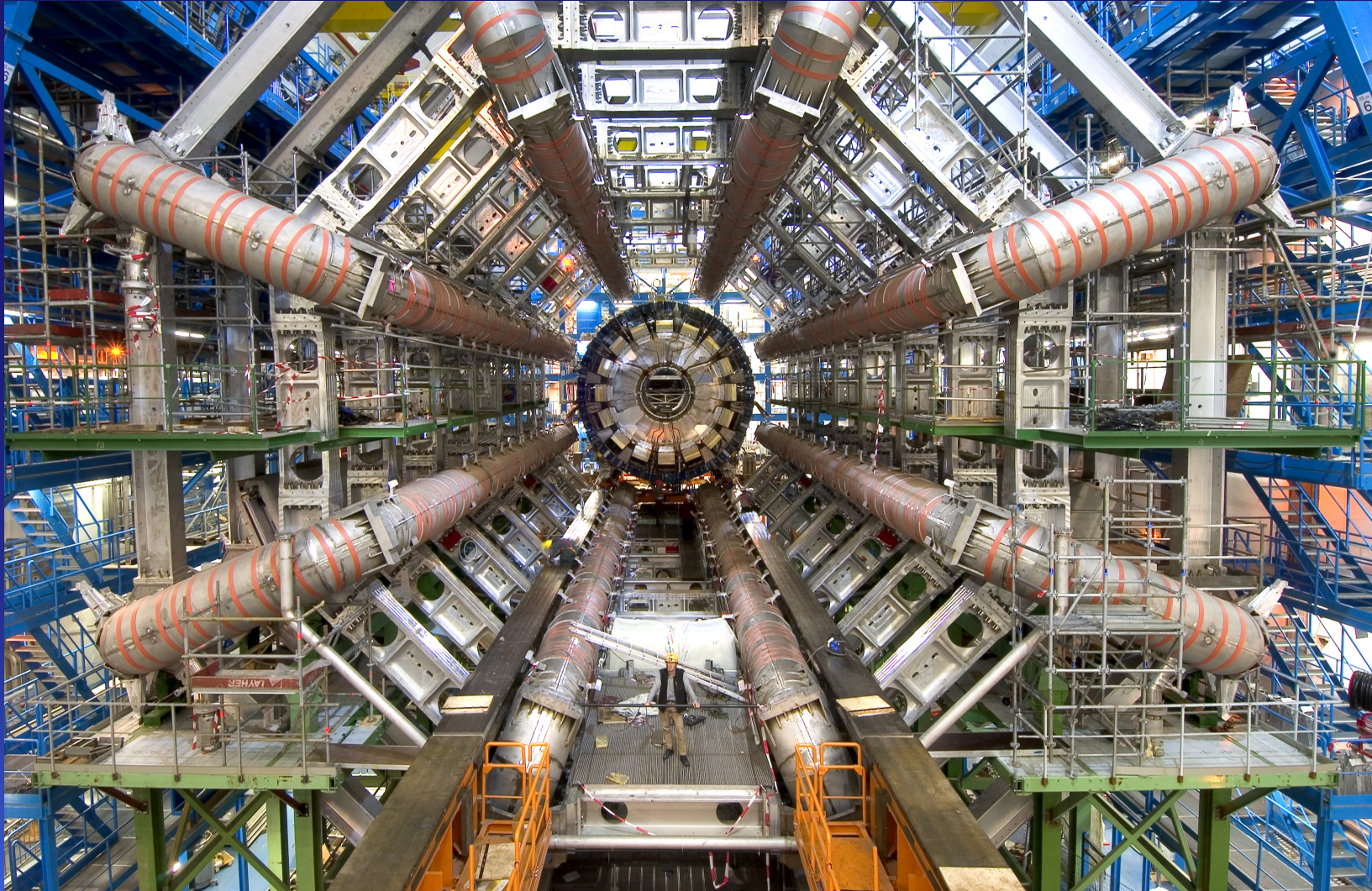
- Teresa Barillari (HEC)
- Siggie Bethke
- Nabil Ghodbane (SCT)
- Stefan Kluth (Computing)
- Sven Menke (HEC)
- Richard Nisius (SCT)
- Horst Oberlack (HEC)
- Peter Schacht (HEC)
- Jochen Schieck (SCT)

PhD students:

- Andrea Bangert (SCT)
- Miguel A. Olivio Gomez (SCT)
- Roland Härtel (SCT)
- Emanuel Rauter (HEC)

Atlas top group at MPI ► involvements in Atlas

- MPI built substantial fractions of 3 Atlas subsystems
- major tasks are now installation and commissioning of the detector components



- top analyses help in detector commissioning

Calorimetry:

- Jet reconstruction
- Jet energy scale and calibration
- in-situ calibration with W-jets
- Missing ET

Vertexing:

- b-tagging

- top pairs need to be understood for many other analyses since they provide a major background
- is the natural transition from hardware oriented work to physics for us

► 2003 PhD by Dieter Striegel

<http://publications.mppmu.mpg.de/?action=search&mpi=MPP-2003-193> about m_t with kinematic fits in the lepton+jets channel with ATLFAST

- estimated systematic error: $\sigma_m^{\text{syst}} = 1.25 \text{ GeV}$ (assuming 1 % accuracy for jet energy calibration)
- ### ► with commissioning in mind main focus will be top-mass measurements in the lepton+jets channel
- ### ► recently we (re-)started to look into full Atlas simulation:
- dependency on jet algorithm (cone vs. kT) and size
 - choice of jet calibration
 - b-tag systematics (e.g. alignment)
- ### ► other channels/observables will likely be added
- ### ► interest in $\sigma_{t\bar{t}}$, top-charge and spin analyses has been raised

- ▶ Inner Detector
 - vertexing
 - alignment
- ▶ Calorimetry
 - clustering
 - hadronic calibration
 - noise suppression