EPE: ATLAS Experiment

Join Us! Contact EPE faculty to explore research opportunities.

Research

- The UW ATLAS group contributed significantly to the discovery of Higgs Boson in 2012. The discovery led to the Nobel Prize in Physics 2013. UW currently plays leading roles in searches for Long-lived particles, Beyond the Standard Model bosons, and Dark Matter.

- Henry Lubatti and Colin Daly (Mechanical Engineer Emeritus Professor) designed and developed the manufacturing specification of drift tubes for the ATLAS Forward Muon Chamber. One-third of the tubes were produced locally in Seattle, mounted to the muon chambers and shipped to CERN.

- Insertable B-Layer (IBL) Phase 0 Upgrade: the UW group was responsible for the design and construction of the IBL Support Tube and IBL Precision Tube, the development of the IBLROD firmware, IBL DAQ software, the commissioning, and operation of the IBL.

- Inner Tracker (ITk) Pixel Phase 2 Upgrade: the UW group is responsible for the design and construction of the Inner Support Tube, the readout system development and production test of ITk Pixel Chip.

Faculty

- Anna Goussiou - Beyond the Standard Model Higgs searches: di-Higgs resonance, 2 Higgs Doublet Models, MSSM Higgs
- Shih-Chieh Hsu - SM EWK subgroup convener (2011-12), Tracking CP convener (2015-17), BSM search in hadronic boson and Higgs
final state

- Henry Lubatti - Group leader, Exotic long-lived particle, muon chamber, IBL Support Tube, ITK
- Joseph Rothberg - Emeritus professor and deputy group leader, muon chamber alignment
- Gordon Watts - Exotic long-lived particle subgroup convener(2012-14), b-tagging convener (2008-10)

Engineers/Technicians

- Colin Daly, UW Mechanical Engineering Emeritus Professor - muon chamber, IBL Support Tube
- Scott Hauck, UW Electrical Engineering Professor - IBL ROD firmware development
- William Kuykendall, UW Mechanical Engineering staff - muon chamber, IBL Support Tube
- Todd Olsen, Computing specialist

Research Associates

- Emma Torro Pastor - Unconventional Signatures and Exotic Higgs subgroup convener (2016-2017), Long-lived particle search & MATHUSLA
- Cristiano Alpigiani - Long-lived particle search & MATHUSLA
- Jana Schaarschmidt - BSM subgroup convener (2018-2020), BSM Higgs search

Ph.D. Students

- Audrey Kvam - Long-lived particle search
- Mason Proffitt - di-Higgs resonance search in 4b channel
- Sean Gasiorowski - di-Higgs resonance search in 4b channel
- Abhishek Rajput - Long-Lived Particle Search

Master's Students

- Lazouich Ford, M. Sc. - di-Higgs search
- Lev S Kurilenko, M. EE - Pixel Layer1/Layer2 ROD upgrade, RDS3a emulator for YARR
- Dustin Werran, M. EE - Pixel B-layer/Disk ROD upgrade
- Douglas Smith, M. EE - RD53a emulator for FELIX

Undergraduate Students

- Nolan Flannery - di-Higgs search
- John Kruper, CS - jet image study
- Cheng Ni, CS & Physics - anomaly detection

Selected Publications

- ATLAS Collaboration, Search for Dark Matter Produced in Association with a Higgs Boson Decaying to b\bar{b} Using 36 fb⁻¹ of pp Collisions at \sqrt{s} = 13 TeV with the ATLAS Detector, PRL 119 (2017) 181804.
• ATLAS Collaboration, Search for long-lived, weakly interacting particles that decay to displaced hadronic jets in proton-proton collisions at \( \sqrt{s} = 8 \) TeV with the ATLAS detector, *Phys. Rev. D92* (2015) 1, 012010

• ATLAS Collaboration, A Particle Consistent with the Higgs Boson Observed with the ATLAS Detector at the Large Hadron Collider, *Science* Vol. 338 no. 6114 (2012) pp. 1576-1582

• ALAS Collaboration, Observation of a New Particle in the Search for the Standard Model Higgs Boson with the ATLAS Detector at the LHC, *PLB 716* (2012) 1-29

**Ph.D. Theses**

• CERN-THESIS-2017-075 - A Search for Long-Lived Neutral Particles Decaying to Hadronic States in Proton-Proton Collisions in the ATLAS Detector at \( \sqrt{s} = 8 \) TeV and \( \sqrt{s} = 13 \) TeV at the LHC by Rachel Rosten, supervised by Gordon Watts

• CERN-THESIS-2016-208 - Search for long-lived particles decaying in the muon spectrometer of the ATLAS detector at the LHC by Heather Russell, supervised by Henry Lubatti

• CERN-THESIS-2016-228 - Searches for Beyond Standard Model Higgs Bosons in pp collisions at \( \sqrt{s} = 8 \) and 13 TeV with the ATLAS detector by Pedro H. S. de Bruin, supervised by Anna Goussiou

• CERN-THESIS-2015-306 - Search for Weakly-interacting, Long-lived particles that Decay to Displaced Hadronic Jets in Proton-Proton Collisions at \( \sqrt{s} = 8 \) TeV with the ATLAS Detector by Daniel Blackburn, supervised by Henry Lubatti

• CERN-THESIS-2013-381 - A Search for the Neutral Higgs Bosons of the Minimal Supersymmetric Standard Model with the ATLAS Detector at the Large Hadron Collider by John Keller, supervised by Anna Goussiou

• CERN-THESIS-2013-129 - Search for Weakly-interacting Long-lived Particles in Proton-Proton Collisions at \( \sqrt{s} = 8 \) TeV with the ATLAS Detector by Orin Harris, supervised by Gordon Watts

• CERN-THESIS-2012-032 - Search for Weakly-interacting Long-lived Particles in Proton-Proton Collisions at \( \sqrt{s} = 7 \) TeV with the ATLAS Detector by Daniel Ventura, supervised by Henry Lubatti

• Thesis 2012 - Measurement of the \( Z \rightarrow \tau \tau \) production cross-section in proton-proton collisions at \( \sqrt{s} = 7 \) TeV with the ATLAS detector by Justin Griffiths, supervised by Anna Goussiou

• Search for Dark Matter in associate production with the Higgs Boson using the ATLAS detector, by Nikola Whallon

**Other Links**

• Former ATLAS members
• ATLAS collaboration homepage
• TeVCluster

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