

Student Rotation Projects on ATLAS

[SLAC ATLAS activity overview](#) (see left menu bar top section for more details)

[Prof. Lauren Tompkins' Stanford ATLAS group portal](#)

Summer 2017 Student Project Proposals

Projects	Contact Person	Student	Location
Silicon sensor testing	Su Dong		SLAC
RCE readout developments	Su Dong / Martin Kocian		SLAC/CERN
b-tagging: studying RNN based vertexing	Michael Kagan		CERN
b-tagging: studying RNN based double b-tagging	Michael Kagan		CERN
tau tagging with 3D imaging and deep neural networks	Michael Kagan		CERN
Boosted $H(\rightarrow b\bar{b})+j$: studying signal selection and impact of new physics	Michael Kagan		CERN
hh $\rightarrow$ 4b: study using ML algorithms for selection	Michael Kagan		CERN
Boosted hh $\rightarrow$ 4b study for high luminosity LHC	Michael Kagan		CERN
Quark/gluon tagging using deep convolutional neural networks	Francesco Rubbo, Ariel Schwartzman		SLAC
Forward pileup jet suppression using deep convolutional neural networks	Francesco Rubbo, Ariel Schwartzman		SLAC
New algorithms for primary vertex selection and reconstruction at high luminosity: addressing the challenge of vertex merging using new techniques and a timing detector	Ariel Schwartzman		SLAC
Double b-tagging reconstruction algorithms	Ariel Schwartzman		SLAC
Pileup jet suppression algorithms for the calorimeter phase 2 upgrade	Ariel Schwartzman		SLAC
Exploring the use of calorimeter timing information to improve the jet energy resolution	Ariel Schwartzman		SLAC
Track-based pileup suppression in the forward region	Ariel Schwartzman		SLAC
Neural network anti-kt jet finding for the phase 2 trigger upgrade	Ariel Schwartzman		SLAC
Improving the jet energy scale calibration using machine learning techniques	Ariel Schwartzman		SLAC
Implementation and study of a new technique for jet pileup mitigation at very high luminosity ("shrinking cone" algorithm)	Ariel Schwartzman		SLAC
Study of vertex pointing in Higgs to gamma gamma events at high luminosity	Ariel Schwartzman		SLAC
Search for New Physics in "untriggerable" final states at ATLAS	Francesco Rubbo		SLAC

Summer 2016 Rotation Project Proposals

Projects	Contact Person	Student	Location
Silicon sensor testing	Su Dong		SLAC
Pileup photon identification and rejection	F. Rubbo, A. Schwartzman		

Quark/gluon tagging using deep neural networks	F. Rubbo, A. Schwartzman		
Double-photon tagging for New Physics searches	F. Rubbo, A. Schwartzman		
Development of novel timing algorithms for pileup jet suppression	F. Rubbo, A. Schwartzman	Randy White	CERN
Leveraging pileup as a zero bias trigger for New Physics searches	B. Nachman, F. Rubbo		SLAC
Geant4 simulation study of intrinsic limitation in calorimeter	Andrea Dotti, Charlie Young		SLAC
Rapidity gap measurements for Higgs physics	F. Rubbo		SLAC

Summer 2014 Rotation Project Proposals

Projects	Contact person	Student	Location
Fuzzy jets	Ariel Schwartzman, Ben Nachman	Conrad Stansbury	SLAC /CERN
Jet tree-structure analysis for W boson tagging	Ariel Schwartzman, Ben Nachman	Matt Solt	SLAC /CERN
Jet-image reconstruction and tagging in ATLAS	Ariel Schwartzman, Michael Kagan		SLAC /CERN
Search for supersymmetric particles in high jet multiplicity events using new jet substructure observables	Ariel Schwartzman, Max Swiatkowski		SLAC
Subjet reconstruction and performance in ATLAS	Ariel Schwartzman, Ben Nachman		SLAC
Investigation of new jet algorithms for the high luminosity LHC upgrade	Ariel Schwartzman, Pascal Nef		SLAC
Topological vertex finding	Ariel Schwartzman, Qi Zeng		SLAC
Pileup mitigation with event combing	Ariel Schwartzman, Pascal Nef	Kareem Hegazy	SLAC
Particle level pileup suppression with JVF filtering	Ariel Schwartzman, Pascal Nef	Marc Robbins	SLAC
Optimization of pileup corrections	Ariel Schwartzman, Pascal Nef	Todd MacDonald	SLAC
Identification of merged primary vertices in high pile-up environment	Ariel Schwartzman, Giacinto Piacquadio		SLAC /CERN
Optimization of WH to Inbb analysis at 14 TeV, optimization of top background rejection using jet substructure obs.	Giacinto Piacquadio		CERN
Develop statistical technique not to profile specific uncertainties in profile likelihood fit	Giacinto Piacquadio		CERN
Optimization of secondary/tertiary vertex finders for b-tagging after IBL insertion	Giacinto Piacquadio		CERN
Use of Deep Neural Network techniques to enhance cluster reconstruction	Michael Kagan, Giacinto Piacquadio		CERN
NLO generator studies to understand W+jet (+bb) production as background for Higgs to bb searches	Giacinto Piacquadio	Matt Solt	CERN
b-tagging calibration in boosted topologies using gluon>bb jets	Ariel Schwartzman, Qi Zeng, Michael Kagan	Zihao Jiang	SLAC /CERN
MSSM Higgs bH/A(bb) search analysis	Giacinto Piacquadio , Katie Malone , Su Dong	Scott Reid	CERN /SLAC
Muon CSC Readout with RCE/ATCA	Su Dong	Kareem Hegazy	SLAC
Pixel/IBL detector commissioning tests and readout development	Martin Kocian , Michael Kagan	Zihao Jiang, Matt Solt	CERN
Cooling Project for a Possible High-Eta Muon Detector	Charlie Young , Marco Oriunno	Leonardo Pirozzi	SLAC
Pixel sensor test beam and analysis	Philippe Grenier		SLAC
Standalone Geant4 Simulation for High-Eta Muon Detection with Iron-Core Toroids	Charlie Young , Tatsumi Koi		SLAC /CERN

Summer 2013 Projects (was proposed and assigned not using this page)

Summer 2012 Rotation Project Proposals

Projects	Contact person	Student	Location
Pixel IBL Stave Testing	Martin Kocian / Su Dong	Ben Nachman	CERN
SUSY search for stop	Till Eifert	Ben Nachman, Qi Zeng	CERN
Fast Physics Monitoring	Till Eifert		CERN

Analysis of 3D Pixel Sensors Testbeam Data	Philippe Grenier	Qi Zeng, Ben Nachman	CERN
Tracking Optimization for the ATLAS b-Jet Trigger	Per Hansson Adrian		SLAC/CERN
b-Jet tagging in boosted jets and jet substructure	Ariel Schwartzman		SLAC/CERN
Topological vertex reconstruction	Ariel Schwartzman		SLAC/CERN
Jet-vertex identification at high luminosity	Ariel Schwartzman		SLAC/CERN
Search for new physics in high multiplicity final state using jet substructure	Ariel Schwartzman		SLAC/CERN
Search of Higgs decaying to bbar pairs using jet substructure techniques	Ariel Schwartzman	Ben Nachman	SLAC/CERN
Study of bH and bZ production	Emanuel Strauss /Su Dong		CERN/SLAC

Fall 2011 Rotation Project Proposals

Projects	Contact person	Student
Improvements to the Small Wheel Muon Detector	Charlie Young	Tim Wiser
Advanced Clustering/Tracking Algorithms in the Pixel Detector	Tim Nelson	
Analysis of Planar and 3D Pixel Sensors Testbeam Data	Philippe Grenier	

Summer 2011 Rotation Project Proposals

Projects	Contact Person	Student	Location
Pixel Calibration on High Bandwidth RCE System	Martin Kocian /Su Dong	Xinlu Huang	SLAC
Studying the ATLAS Interaction Region with LHC Beam Instrumentation	Rainer Bartoldus	Danjie Wenren	CERN
New vertexing b-tag for level-2 b-jet trigger	Per Hansson	Xinlu Huang	SLAC

Spring 2011 Rotation Project Proposals

Projects	Contact Person	Student	Location
Advanced Tracking Algorithms using the ATLAS Pixel Detector 2	Tim Nelson		SLAC
Pixel cosmic telescope online monitoring	Martin Kocian	Kurt Barry	SLAC

Winter 2011 Rotation Project Proposals

Projects	Contact Person	Student	Location
Jet pull study	Andy Haas		SLAC
Study of overlaid background events	Andy Haas		SLAC
Advanced Tracking and Pixel Clustering	Tim Nelson	Kurt Barry	SLAC

Fall 2010 Rotation Project Proposals

Projects	Contact Person	Student	Location
Testbeam analysis of 3D pixel sensors	Philippe Grenier		SLAC
A Search For Quirks at the LHC	Tim Nelson	Jim Black	SLAC
Advanced Tracking Algorithms using the ATLAS Pixel Detector	Tim Nelson		SLAC
Study of Truncated Events in the ATLAS Pixel Detector	Tim Nelson		SLAC
Studying the Kinematics of Lepton Jets	Tim Nelson		SLAC
Cosmic Telescope Monitoring	Martin Kocian		SLAC
Jet Pull Study	Andy Haas		SLAC
Study of cosmic muon backgrounds in calorimeter	Andy Haas	Kurt Barry	SLAC

Summer 2010 Rotation Projects

Projects	Contact Person	Student	Location
Jet energy offset correction for pile up	Ariel Schwartzman	Spencer Gessner	CERN
Jet Substructure Study	Ariel Schwartzman	Max Swiatlowski	CERN
Pixel optical link longevity tests	Charlie Young	Katie Malone	CERN
Beam spot Z position jitter effect	Charlie Young	Spencer Gessner	CERN
Pixel occupancy data truncation study	Tim Nelson	Max Swiatlowski	CERN
Pixel Detector Calibration Visualization	Per Hansson	Per Dahlback (CERN)	CERN
DSP tile programming in RCE	Martin Kocian	Jesse Sherer	SLAC
High Speed I/O board testing	Martin Kocian/Dave Nelson	Lawrence Carlson (Fresno State)	SLAC
Testbeam analysis of 3D pixel sensors	Philippe Grenier		CERN/SLAC
Overlay of real data with simulation - part 2	Andy Haas		SLAC
Studies of muons in data and MC - part 2	Andy Haas		SLAC
Analysis and the Atlantis event display	Andy Haas		SLAC
Comparison of data and background calculation	Charlie Young		CERN/SLAC

Past Rotation Projects

For any general questions regarding the SLAC ATLAS program or choices of the rotation projects, please contact Prof. Dong Su (sudong@slac.stanford.edu)