Baojia(Tony) Tong

Harvard University
Department of Physics
17 Oxford Street
Cambridge, MA 02138

baojia.tong@physics.harvard.edu
Web: http://btong.web.cern.ch/btong/
Skype: baojia.tong
Phone: +1 (617) 710-9767

Education

Harvard University, Massachusetts, MA
Ph.D., Physics, expected May 2017
M.A., Physics, 2014
Committee: Profs. Melissa Franklin (Adviser), Masahiro Morii, Howard Georgi

California Institute of Technology, California, CA
B.A. with honors, Physics, 2012

Research Interests

Searches for new physics models with the Higgs Boson
Di-boson production and measurement at TeV scale
Charged particle prompt reconstruction
Detector operation, monitoring and upgrade development

Research Experience

Harvard University

Analyzer, $X \to$ boosted $hh \to b\bar{b}b\bar{b}$ using ATLAS 13TeV data	2015-2016
Developer, Improvement of Segment Seeding in Muon Reconstruction	2015-2016
Co-developer, Offline Data Quality Software for Muon Reconstruction	2015-2016
Expert and organizer, Offline Muon Data Quality Monitoring	2015
Analyzer, Prospective study of $hh \to WW\tau\tau$ for High Lumi LHC	2014
Calibration of Prototype Micromegas Chambers at Harvard	2014
Study of Muon Segments in ATLAS detector using 8TeV data	2012-2013

California Institute of Technology

Study of Vector Boson + Jets using CMS 8TeV data	2011-2012
Design and validation of an optical sensor for telescopes	2009-2010
Design experiment and study of market convergence	2009-2010
Modeling on novel methods of space launching	2008-2009

Detailed Research Contributions

Analysis

Search for $X \to$ boosted $hh \to b\bar{b}b\bar{b}$ using ATLAS 13TeV data

Devised signal regions, improved search sensitivities
Revised data-driven background estimation methods
Validated signal MC simulations
Updated software framework, produced analysis NTuples
Selected and validated analysis trigger, optimized event selection
Evaluated systematics for detector responses and data-driven methods
Calculated asymptotic exclusion limits
Drafted supporting documents, produced event displays

Prospective study of $hh \to WW\tau\tau$ for High Lumi LHC

Designed signal regions and event selections
Tested multivariate analysis methods and increased signal sensitivities
Predicted cut-based and multivariate analysis combined significances

Hardware

Prototype Micromegas Tests

Calibrated charge and timing of prototype chambers
Assisted cosmic muon data taking
Analyzed and measured cosmic muon charge and timing distriubutions

Software

Muon Reconstruction

Created parabolic road extrapolation for raw Muon detector hits selection
Resolved previous bugs in road extrapolation

Muon Monitoring

Developed, updated and maintained Muon Performance Monitoring packages
Designed and maintained offline Muon Performance Monitoring Displays
Improved and maintained offline Muon Detector and Performance Monitoring Algorithms
Maintained Muon Performance Monitoring packages for prompt online Monitoring

Operation

Muon Data Quality

Organized weekly meetings on offline software updates and data quality status
Coordinated offline Muon Detector Monitoring software updates
Created offline shifter training materials and instructions
Created webpages for offline shifter records
Communicated between detector and performance experts

Shifts

Participated online ATLAS Control Room Shifts: Muon Desk, Data Quality Desk
Participated offline Muon Data Quality Shifts: sign-offs
Participated offline Expert Shifts: assisted the shifters for offline Muon Data Quality

Publications and Talks (with links)

Paper

Search for pair production of Higgs bosons in the $b\bar{b}b\bar{b}$ final state at ATLAS — 2016

Public Notes

ATLAS-CONF-2016-049, $hh \to 4b$, ATLAS 13TeV, $13fb^{-1}$ — 2016 summer
ATLAS-CONF-2016-017, $hh \to 4b$, ATLAS 13TeV, $3fb^{-1}$ — 2016 spring

Public Talks

ATLAS $hh \to 4b$ ICHEP Results, Higgs Boson and BSM, Weihai, China — 2016

Selected ATLAS Talks

$hh \to 4b$, analysis ICHEP ATLAS Approval — 2016
$hh \to 4b$, analysis ICHEP Exotics Approval — 2016
$hh \to 4b/bb\tau\tau/bbWW$, Exotics Workshop, Grenoble — 2016
Muon Segment Seeding, Muon Week, Software — 2016
Muon Hough Transform Tuning, Muon Week, Software — 2015
Muon Spectrometer and DQ Status, ATLAS Weekly — 2015
Muon DQ 2015 Summary, Muon Week, Operations — 2015
Muon DQ Pre Run II Status, Muon Week, Operations — 2015
Muon DQ Shifter Manual — 2015

Teaching Experience

Physics Department, Harvard University

Guided undergraduate student Gray Putnam's summer research — 2016
Guided undergraduate student Michael Albergo's summer research — 2015
Teaching Fellow, Physics 125, Widely Applied Physics, Qscore 4.33/5 — 2014
Teaching Fellow, Physics 16, Classical Mechanics and Relativity, Qscore 4.47/5 — 2013

Physics Department, California Institute of Technology

Teaching Assistant, Physics 50, Physics League — 2011-2012

Honors

Harvard White Teaching Prize for Physics 16 — 2014
Harvard Traveling Scholar — 2015-2016
Caltech Undergrad Summer Research Fellowship — 2009-2012

Languages and Skills

Chinese (native), English (proficient), French (elementary)
C++, HTML, LaTeX, Matlab, Mathematica, Python, ROOT

References

Dr. Christoph Amelung
Physics Department
Brandeis University
christoph.amelung@cern.ch
+41 (22) 767-1695

Professor Melissa Franklin
Physics Department
Harvard University
franklin@physics.harvard.edu
+1 (617) 495-2909

Dr. Michael Kagan
Physics Department
Stanford Linear Accelerator Center
mkagan@cern.ch
+41 (75) 411-1923

Professor Mel Shochet
Physics Department
University of Chicago
shochet@hep.uchicago.edu
+1 (773) 702-7440