National Science Foundation (NSF) International Research Experience for Students (IRES) Program for California State University (CSU) Students to work at CERN on ATLAS Experiment of LHC

Benefits
- Travel/work at CERN in Geneva, Switzerland for at least 8 weeks during summer
- Each student receives $5,500
- Work with ATLAS physicists from top research institutions from all over the world
- Attend the famous CERN Summer Student Lecture Series given by top physicists
- Visit European cities and culture

ATLAS Detector
- Largest particle detector ever built
- > $1 Billion (>250M from US DOE/NSF)
- Taking data since 2009

ATLAS Collaboration
- ~3000 physicists from ~200 institutions of 38 countries all over the world
- ~500 physicists from ~40 US universities (Harvard, Yale, MIT, Chicago, Columbia, UC-Berkeley, Michigan, Stanford, UPenn, Washington, Wisconsin, etc.) and 4 US national labs (ANL, BNL, LBL, and SLAC)
- CSU Fresno, Sacramento, East Bay joined ATLAS in 2007, 2014, 2017 and formed the CSU ATLAS group

Discovery of Higgs (“God” particle) by ATLAS/CMS
- 2012 “Breakthrough of the Year” by Science magazine
- Resulted in award of 2013 Nobel Physics Prize to the Higgs theory
- CSU Fresno: Only CSU campus involved in the Higgs discovery, first research a CSU was ever involved in which has resulted in a Nobel Prize

Higgs (“God” particle) Candidate Events

CSU Fresno ATLAS Program
- Faculty/PI: Prof. Yongsheng Gao (2007 to present)
- Postdocs: Dr. Harinder Bawa (2008 to present) and Dr. Andrew Lowe (2010 to 2012)
- Visiting Ph.D students: Wei Ding (Tsinghua University, China) and Dengfeng Zhang (Shandong University, China)
- ~8 Master & undergraduate students
- Strong support from CSU Fresno Provost, CSM, “Breakthrough of the Year” by Science magazine
- ~$500K annual ATLAS membership fee to CERN from NSF
- Elementary Particle Physics (EPP) since 2007
- 4 NSF EPP core grants ($1,531K) since 2009, including $460K EPP core grant from 2009 to 2012 which was the first ever such grant to a CSU campus
- $250K NSF International Research Experience for Students (IRES) grant (2015 to 2018) which supported 15 CSU students to work at CERN from 2016 to 2018
- $300K NSF International Research Experience for Students (IRES) grant (3/2019 to 2/2022) to support 18 CSU students to work at CERN during summers of 2020 to 2022 (6 students per summer, ~$5,500 per student)
- CSU Fresno ATLAS faculty and postdocs have authorship in every ATLAS publication (~100 papers each year in top physics journals)
- Reported in ABC-30, CBS-47, KSEE-24, Fresno Bee, Valley NPR, etc.
- Key component of CSU Nuclear and Particle Physics Consortium (NUPAC) which currently consists of 18 CSU campuses: Bakersfield, Channel Islands, Chico, Dominguez Hills, East Bay, Fresno, Humboldt, Los Angeles, Long Beach, Northridge, Pomona, Sacramento, San Bernardino, San Francisco, San Luis Obispo, San Marcos, Sonoma, and Stanislaus
- Home institution of the CSU ATLAS group with Yongsheng Gao as team leader, Joshua Moss (Sacramento) and Kathryn Grimm (East Bay) as deputy team leaders of the CSU ATLAS group
- Contact: Dr. Yongsheng Gao
  Phone: 559-278-4554
  Email: yogao@csufresno.edu
  Web: http://zimmer.csufresno.edu/~yogao/ATLAS/

CERN
- CERN stands for European Organization for Nuclear Research in French
- ~10,000 scientists from 38 countries all over the world

CSU Students at CERN
- 5 to 12 students from NUPAC campuses to CERN every summer since 2008. Over 70 CSU students from 11 NUPAC campuses have worked at CERN since 2008
- Presented at international ATLAS Working Group meetings, regional/national conferences, attended famous CERN Summer Student Lecture Series given by top physicists from all over the world
- After working at CERN: Teaching, high-tech companies, and Ph.D programs (UC-Berkeley, UCLA, UCSD, UCSC, UCD, USC, Colorado, Indiana, Iowa, Michigan, UMass, Purdue, Washington, Wisconsin, Hamburg, CEA Saclay, HEPHY Vienna, etc.)
- ATLAS/CERN working experience prepares CSU students for their personal and professional success in an increasingly competitive, global, and multi-cultural society

Eligibility
- Full-time physics undergraduate or graduate students from 18 CSU Nuclear and Particle Physics (NUPAC) campuses
- Must be US Citizen or permanent resident
- Take online particle physics course with CSU Fresno in the fall semester (TTH 9:00 am to 10:15am) through CSU Fully Online
- Submit full application by Dec. 15 deadline
- http://zimmer.csufresno.edu/~yogao/ATLAS/
- Women, minorities, first-generation college students STRONGLY encouraged to apply

Student Success
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