Data and Computational Science, Graduate Certificate

**Director**
Robert Harrison, IACS L165, 631-632-2347

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**Degree Awarded**
Advanced Graduate Certificate in Data and Computational Science

**Website**
https://iacs.stonybrook.edu/opportunities/certificates/cdcs

**Description**
The Institute for Advanced Computational Science (IACS) at Stony Brook University was established in 2012 with a $20M private endowment. The institute has core faculty in a variety of computational disciplines (chemistry, physics, ecology and evolution, materials, atmospheric science, geoscience, social science, applied mathematics, linguistics, and computer science) and seeks to make sustained advances in the fundamental techniques of computation and in high-impact applications. Together with the Brookhaven National Laboratory Computational Science Initiative, our integrated, multidisciplinary team of faculty, students, and staff overcome the limitations at the very core of how we compute, collectively take on challenges of otherwise overwhelming complexity and scale, and individually and jointly define new frontiers and opportunities for discovery through computation.

IACS offers a 17-credit Advanced Graduate Certificate in Data and Computational Science (CDCS), available to both PhD and MS/MA students.

**Admission Requirements**
PhD and MS/MA matriculated students in the following departments are eligible to participate in the certificate program: Applied Mathematics and Statistics, Ecology & Evolution, Materials Science and Chemical Engineering, Chemistry, Computer Science, Geosciences, Molecular and Cellular Biology, Sociology, SOMAS, Physics and Astronomy, Neurobiology and Behavior, Pharmacology, Psychology, Tech and Society, Economics, and Linguistics. Students must have the permission of their advisors and their Graduate Program Directors before enrolling in the certificate program, and they must meet with the IACS Graduate Certificate Coordinator to map out a course schedule. Students must complete, with the requisite signatures, and submit to the Graduate School the form entitled Permission to Enroll in a Secondary Certificate Program.

**Facilities**
The institute is located in the IACS Building, next to the Laufer Center for Physical and Quantitative Biology. Our space houses the institute’s faculty, students/postdocs (circa 45), and technical/administrative staff. The combined resources of the endowment, university and external funding provide for the institute a substantial computational capability (circa 20TFLOP/s) including substantial storage (circa 1Pbyte) and state-of-the-art 10GB networking throughout the building (optical fiber within the building to major hubs across campus). The institute provides to its members office space, office materials and supplies, administrative support, commonly used software packages including select compilers and libraries, technical assistance with computer administration and software installation, and use of the institute’s computer clusters.

**Degree Requirements**
- 17 credits, courses can be double counted toward the certificate and the student's major
- Three core courses: (1) JRN 501: Distilling Your Message (2); JRN 503 Improvisation for Scientists (3); DCS 521 Introduction to Computational and Data Science (Spring - Students are strongly encouraged to take DCS 521 in their first year of study)
- Students are expected to take at least 3 credits in AMS and 3 credits in CS from the course catalog (cdcs-course-catalog-final.docx).
  ----- CS students: at least 3 credits in AMS and 3 credits in a non-CS crosslisted course in any department
  ----- AMS students: at least 3 credits in CS and 3 credits in a non-AMS crosslisted course in any department
- Up to 6 credits of courses that are listed in the course catalog from the student's home department can count toward the certificate
- CDCS Course Catalog.pdf

**Faculty**
Alan C. Calder, PhD, Vanderbilt University, Physics and Astronomy
Barbara Chapman, PhD, Queen’s University, Computer Science
Rezaul Alam Chowdhury, PhD, University of Texas Austin, Computer Science
Marivi Fernandez-Serra, PhD, University of Cambridge, Physics and Astronomy

Stony Brook University Graduate Bulletin: www.stonybrook.edu/gradbulletin
Robert J. Harrison, PhD, University of Cambridge, Applied Mathematics and Statistics
Jeffrey Heinz, PhD, University of California Los Angeles, Linguistics
Xiangmin Jiao, PhD, University of Illinois at Urbana-Champaign, Applied Mathematics and Statistics
Marat Khairoutdinov, PhD, University of Oklahoma, SOMAS
Predrag Krstic, PhD, City College of CUNY, IACS
Benjamin Levine, PhD, University of Illinois at Urbana-Champaign, Chemistry
Heather Lynch, PhD, Harvard University, Ecology and Evolution
Owen Rambow, PhD, University of Pennsylvania, Linguistics
Matthew Reuter, PhD, Northwestern University, Applied Mathematics and Statistics
Yifan Sun, PhD, University of California, Los Angeles, Computer Science
Jason Trelewicz, PhD, Massachusetts Institute of Technology, Materials Science and Chemical Engineering
Yongjun Zhang, PhD, University of Arizona, Sociology

NOTE: The course descriptions for this program can be found in the corresponding program PDF or at COURSE SEARCH.