Institute for Advanced Computational Science

Robert J. Harrison, Director

robert.harrison@stonybrook.edu

What is IACS?

- A multidisciplinary institute with a focus on computational and data science
- $20M endowment
- 13 core faculty, 34 affiliate faculty, 90+ students
- Newly renovated space
  - ~6000 sq. ft., 17 faculty offices, 45 students

What is Computational Science?

Simulation

Data

Hardware/Software

IACS Core Faculty

Alan Calder
Physics & Astronomy

Barbara Chapman
Applied Math,
Computer Science

Rezaul Chowdhury
Applied Math

Marivi Fernandez-Serra
Physics & Astronomy

Robert Harrison
IACS Director

Jeffrey Heinz
Linguistics

Xiangmin Jiao
Applied Math

IACS Core Faculty

Marat Khairoutdinov
SOMAS

Predrag Krstic
IACS

Heather Lynch
Ecology & Evolution

Artem Oganov
Geosciences

Jason Trelewicz
Materials Science

Matthew Reuter
Applied Math

IACS Students

96 Students - 41 core; 55 affiliated


Zafar Ahmad


Alena Aksenova


Joel Anderson


Catherine Foley


Aditi Ghai


Bento Goncalves


Hina Arora


Shilpi Bhattacharyya


Alexander Borowicz


Longtao Han


Rachael Herman


Mohammad Mahdi Javanmard


Qiao Chen


Bin Cheng


Rathish Das


Yipeng Li


Wenbin Lu


Maureen Lynch


Mahdi Davari


Aniello De Santo


Sebastian Dick


Philip McDowall


Delafrouz Mirfendereski


Alok Mishra


Simon Divilov


Hossep Dolatian


Olivia Donaldson


Jonathan Rawski


Hamid Reza As'adi


Panu Sam-Ang

Where do Alumni get jobs?

- Assistant Professor of Mathematics, St. Peter's University, NJ
- Postdoctoral Associate, University of Maryland
- Founder & CEO, Learning is Beautiful
- Postdoctoral Associate, Michigan State University
- Solutions Architect, NVIDIA
- Research Scientist, Google
- HPC Software Architect, Intel Corporation
- Technical Staff, Vmware
- Senior R&D Engineer, Synopsys Inc.
- Software Development Engineer, Amazon.com Inc.

IACS Computer Resources

- Handy
  - 40 dual-socket Sandybridge nodes, 2 NVIDIA K20 GPUs, 2 Intel KNC, 250 TB disk
- LI-red
  - 100 dual-socket Haswell nodes, 250 TB disk
  - 1 quad-socket Haswell node with 3 TB memory
  - 1 IBM Power8 node
- Two Intel KNL development systems
- Sea-wulf
  - 160+ dual-socket Haswell nodes, 1PB disk, 32 NVIDIA K80 GPUs

Center for Inclusive Education & IACS

- **Turner Dissertation Fellowship**
  - 1 or 2 year awards ($10k per year)
  - PhD Student at SBU
  - US Citizen or Permanent Resident
  - Advancement to Candidacy
  - Nominations-based
- **Faculty Career Week**
- **Research Café Series**
- **Recruitment Conferences & Campus Visits**

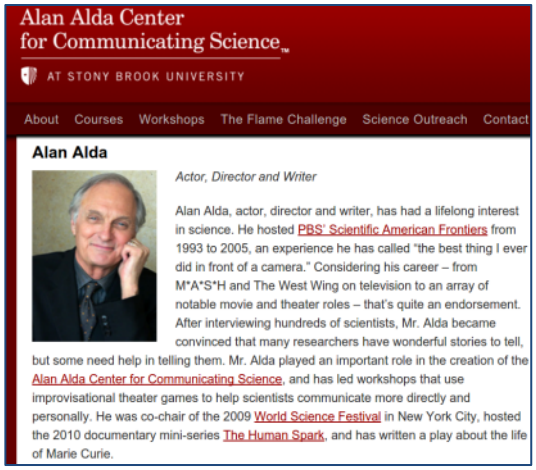
(L) Adrian Soto Cambres and Rosalia Davi represented the Institute for Advanced Computational Science and the Center for Inclusive Education at the 2016 Richard Tapia Celebration of Diversity in Computing in Austin, TX.

CDCSE Certificate (not yet approved)

17 credits

- ✧ 3 core courses

  JRN 501 Distilling Your Message
  JRN 503 Improvisation for Scientists
  AMS 561 Intro to Computational Science



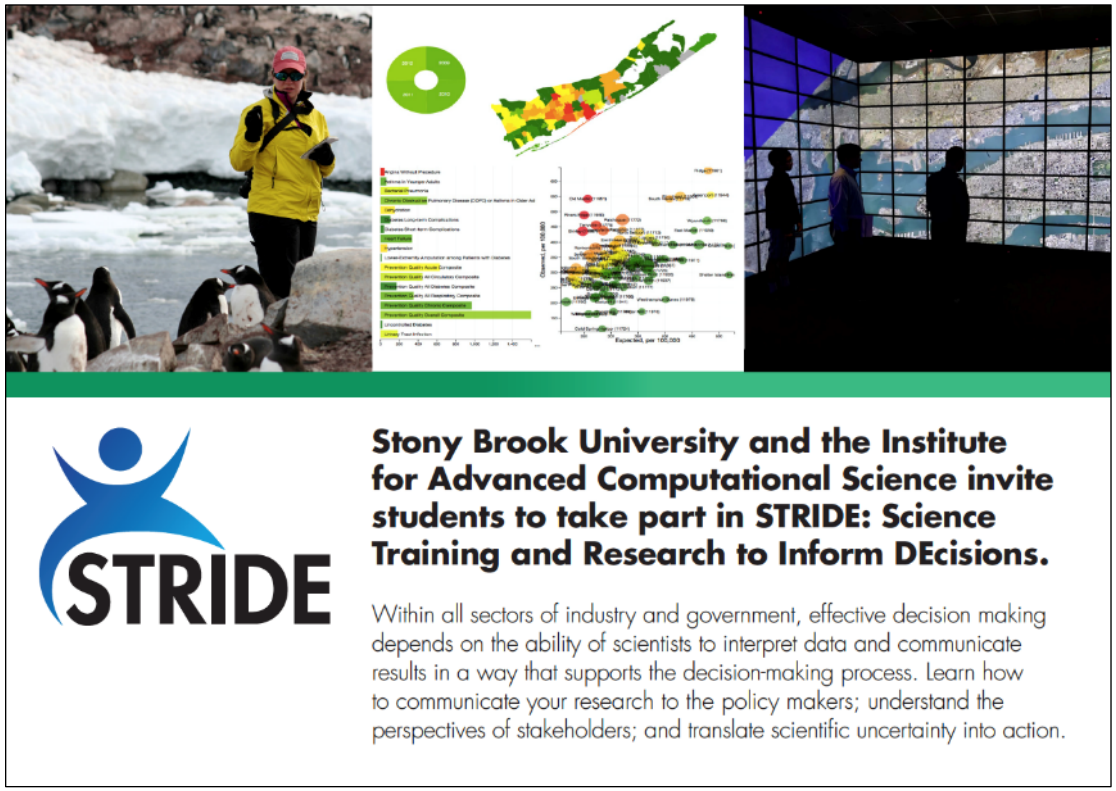
STRIDE Certificate (approved)

15 credits

- ✧ 6 core courses

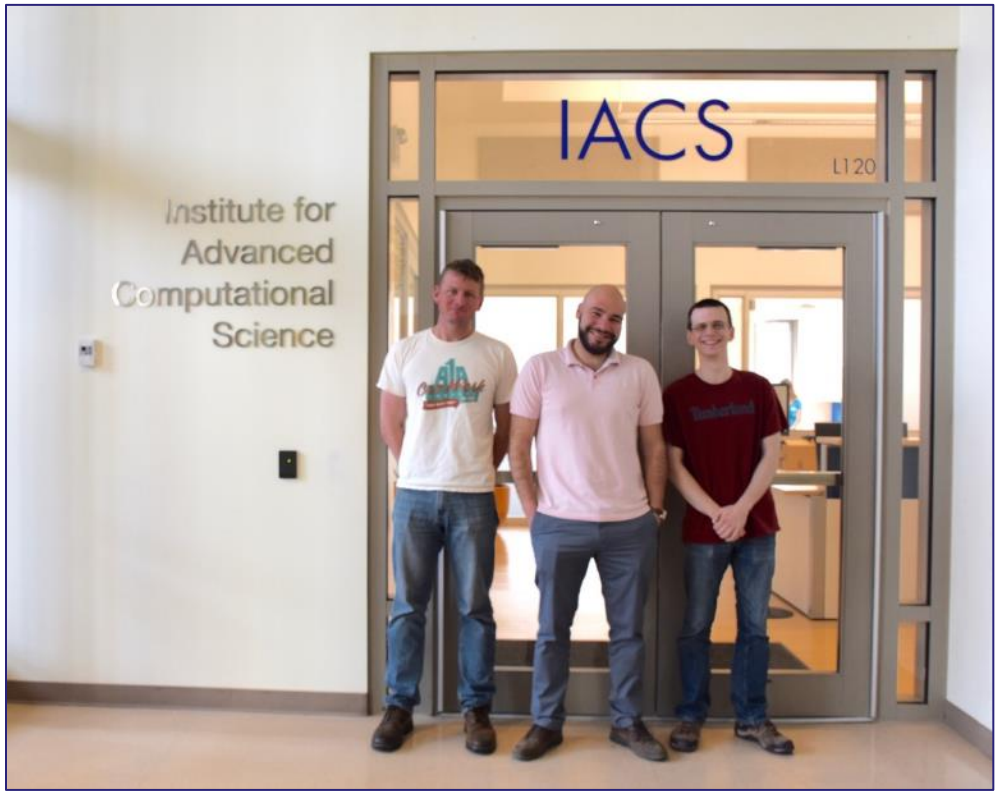
  JRN 501 Distilling Your Message
  JRN 503 Improvisation for Scientists
  MAR 534 Scientific Decision
  CSE 564 Visualization
  JRN 511 Scientific Communication for Decision Makers
  Home Department Statistics course

STRIDE



Science Training and Research to Inform DEcisions

IACS Student Association



Research Events
- IACS Student Seminar Series
- Brown-Bag Lunch Sessions

Professional Development
- Scientific Communication Workshop
- Patents Workshop

Social Events
- Student-Faculty Dinners
- Group Outings to NYC

Social Networking

Student Seminar Series

New Student Seminar Series started in fall 2016, organized by the IACS Student Association

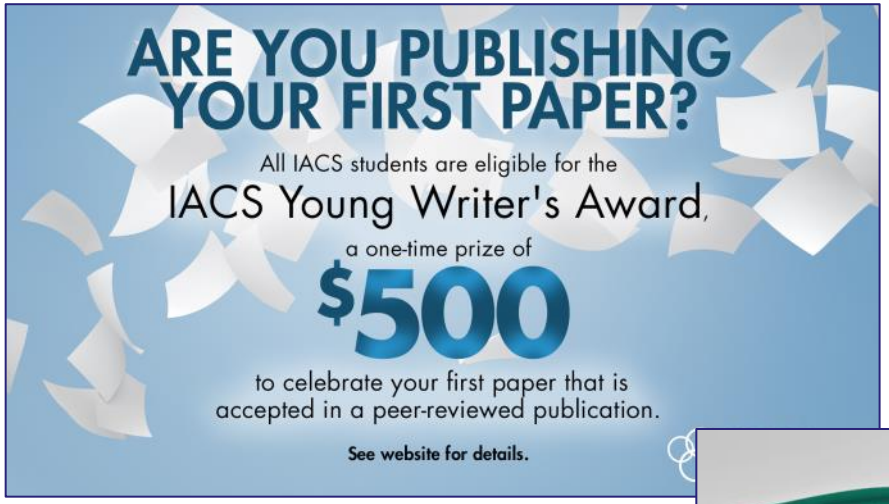
Students are offered a 'trial run' in front of their peers two days before presenting

IACS Researcher Awards

Raises department-paid stipend to $34K plus $4k for travel and equipment

Aditi Ghai | Alena Aksenova | Bento Gonçalves | Maria Barrios Sazo | Zeyang Ye | Rathish Das

IACS Travel & Writing Awards



Workshops, Tutorials, Courses

PHY 546: Python for Scientific Computing
Instructor: Michael Zingale, michael.zingale@stonybrook.edu
Mondays, 3:00-3:53pm
1 credit, Students need to bring laptops to class

Python for Scientific Computing
a weekly graduate seminar on techniques for scientific programming
instructor: Michael Zingale (michael.zingale@stonybrook.edu)

Python has seen wide adoption in the scientific community for data analysis, simulation, prototyping, and visualization. It provides a simple, yet powerful means to build applications. This seminar introduces python and its use in scientific computing.

- Flipped course format:
  - We'll work through interactive notebooks *outside of class*

- Topics include:
  - Python
  - Version control with git/github
  - Jupyter notebooks /workflow management
  - The NumPy array package
  - The SciPy tools and basics of numerical methods
  - Matplotlib and Plot.ly for visualization

PHY 504: Computational Methods in Physics and Astrophysics
Instructor: Alan Calder (alan.calder@stonybrook.edu), 3 Credits
Time: Monday, Wednesday, Friday 9:00 to 9:53 AM
Location: Math SINC Site, Students will use the computers provided

An introduction to procedural and object-oriented programming in a high-level language such as C++ or modern Fortran with examples and assignments consisting of rudimentary algorithms for problems in physics and astronomy. Students will use the UNIX/ Linux operating system to write programs and
will include an
ting and good
s version control and
epare students
methods that assume a

This new graduate introduction to programming course is being offered in the spring of 2017 and it is meant to be an introduction to programming and the Linux/ Unix operating system for students with no prior programming experience. Students will gain the knowledge and experience to begin computational research or take advanced computational courses that assume programming experience.

Please note that while this is a physics course, the examples and assignments will be appropriate for students with a variety of backgrounds.

Stony Brook University | Institute for Advanced Computational Science

Home | About | Directory | Events | Research | Resources | Opportunities

EVENTS

Seminars
Workshops
Events

EVENT CALENDAR

Calendar link

GPU Programming Workshop

View | Edit

The overwhelming interest in the GPU Hackathon hosted at Brookhaven National Laboratory (www.bnl.gov/gpuhackathon) makes it clear that there is a strong demand for hands-on training for GPU programming. We will partner with NVIDIA and in particular its PGI compiler team to organize a 3-day hands-on GPU programming workshop/mini-Hackathon for teams that were not admitted to the Brookhaven Hackathon.

Registration required. Click here to register.

SPEA
Matth
DATE
Mond
Wedn
TIME
Mon-
Wed-

DAY 1: The first day will consist of introductory lectures given by PGI compiler engineer Matt Colgrove,NVIDIA and is open to the public.

DAY 2 & 3: The 2nd and 3rd days will be spent on the Hackathon application teams' codes. GPU experts will be present to answer questions and assist the teams to get started with their GPU porting efforts.

IACS Research Day

Morning presentations followed by lunch and poster session

Opportunities to teach

- Undergraduate Python
- Research Methods Workshop
- High School Python
- Master Teacher Python
- R programming

Questions?

Lynn Allopenna, Administrative Director

Lynn.Allopenna@stonybrook.edu/2-2345

Sarena Romano, Travel & Event Coordinator

Sarena.Romano@stonybrook.edu/2-2346

Jennifer McCauley, STRIDE administrator

Jennifer.Mccauley@stonybrook.edu/2-2341

Rosalia Davi, CIE Diversity Outreach Coordinator

Rosalia.Davi@stonybrook.edu/2-7401