

2022 National Nuclear Physics Summer School held at MIT

William Detmold, MIT for the organisers

The 2022 National Nuclear Physics Summer School was held at MIT from July 11th through July 22nd, 2022. The organisation was overseen by a committee comprising William Detmold, Or Hen and Lindley Winslow, all members of the MIT physics faculty in the Laboratory for Nuclear Science (LNS). LNS provided extensive administrative support with Elsy Luc in particular expending considerable effort on the organisation and running of this school, representing an important in kind contribution from MIT to the school. The financial administration was taken care of in the Department of Physics.

The school website is available at <https://web.mit.edu/2022nnpss/index.html>

1. Lecturers and Topics

Lecturers and their topics are listed in Table I. The schedule is shown on the website above. Lecturers were selected by the committee as a whole and in most cases the first lecturer in a topic was able to participate. There were 13 lecturers of which 6 (46%) were female. All but two lecturers were US based.

Table I: lecturers

Lecturer	Institution	Topic	Number
Maria Piarulli	Washington University St Louis	NN Interaction and Many-Body Methods	3
Phil Harris	MIT	AI for Data Analysis	3
Ronald Garcia Ruiz	MIT	Fundamental Symmetries	3
Julieta Gruszko	North Carolina	Neutrinoless Double Beta Decay	3
Douglas Higinbotham	JLab	Hadronic Physics, Detectors and Accelerators	5
Cristiano Fanelli	JLab	AI for Detector Design	3
Marina Marinkovic	Zürich	Lattice QCD	3
Jacquelyn Noronha-Hostler	UIUC	Hot QCD Matter	3
Alessandro Roggero	Trento	Quantum Simulations	3
Alex Sushkov	Boston University	Quantum Sensing and Dark Matter Searches	3
Heather Crawford	LBNL	Nuclear Structure	3
Shirley Li	FNAL	Neutrino Oscillations	3
Zach Meisel	Ohio University	Nuclear Astrophysics	3

2. Students

Students are listed in Table II. We received around 120 applications for the school and were able to accept 63 along with 5 MIT students that officially registered. Sixteen students (24%) identified as female and three students (4%) identified as other gender or preferred not to report their gender. Four students were from international institutions.

Table II: students

First Name	Last Name	Current Organization
Manoa	Andriamirado	Illinois Institute of Technology
Carter	Ball	University of Maryland--College Park
Michał	Barej	AGH University of Science and Technology, Krakow, Poland
Sylwia	Bazak	Institute of Physics, Jan Kochanowski University
Somadutta	Bhatta	Stony Brook University
Kevin	Bhimani	University of North Carolina at Chapel Hill
Alex	Brinson	MIT
Scott	Carmichael	University of Notre Dame
Ding	Chen	University of California, Riverside
Sruthy Jyothi	Das	University of Colorado Boulder
Provakar	Datta	University of Connecticut
Aman	Dimri	Stony Brook University
Tatiana	Espinoza	University of New Mexico
Roland	Farrell	University of Washington
Berenice	Garcia	University of Colorado, Boulder
Bianca	Gualtieri	Florida International University
Zack	Hall	University of North Carolina at Chapel Hill
Yiding	Han	Rice University
Jiachen	He	University of Kentucky
Mengyao	Huang	Iowa State University
Ajharul	Islam	Kent State University
Md Habib E	Islam	Old Dominion University
Haruka	Kakioka	MIT
Hyun-Gyu	Kim	Korea Advanced Institute of Science and Technology
Garrett	King	Washington University in St. Louis

First Name	Last Name	Current Organization
Andreas	Kirchner	ITP Heidelberg
Andi	Mankolli	Vanderbilt University
Nicholas	Mendez	Michigan State University
M. Ibrahim	Mirza	The University of Tennessee, Knoxville
Chinmay	Mishra	University of Tennessee
Marianne	Moore	MIT
Scott	Moroch	MIT
Jonathon	Mott	University of Massachusetts at Amherst
Girish	Muralidhara	University of Kentucky
Angel	Nava	University of Houston
Ha	Nguyen	Duke University
Cynthia	Nunez	University of Michigan - Ann Arbor
Patrick	Oare	MIT
Hyunwoo	Oh	University of Maryland, College Park
Tanmay	Pani	Rutgers University
Zaki	Panjsheeri	University of Virginia
Fabian Camilo	Pastrana Cruz	MIT
Pratyush Kumar	Patel	University of Massachusetts, Amherst
Churamani	Paudel	Florida International University
Rebecca	Preston	Texas A&M University at Commerce
Brendan	Reed	Indiana University
Jake	Richter	Texas A&M University at Commerce
Michael	Roosa	Texas A&M University
Diptanil	Roy	Rutgers University
Marc	Salinas	Florida State University
Benjamin	Santoyo	Texas A&M University–Commerce
Oleh	Savchuk	Bogolyubov Institute for Theoretical Physics
Sebastian	Seeds	University of Connecticut
Shahina	Shahina	University of Notre Dame
Lars	Sivertsen	Iowa State University
Patrycja	Słoń	National Centre for Nuclear Research (NCBJ)

First Name	Last Name	Current Organization
Wyatt	Smith	Indiana University
Amber	Stinson	Texas A&M University - Commerce
Jhih-Ying	Su	University of Massachusetts Amherst
Chuan	Sun	Stony Brook University
Silviu-Marian	Udrescu	MIT
Kenneth	Vetter	UC Berkeley
Xiatong	Wu	UCLA
Zhiwan	Xu	University of California, Los Angeles
Rui	Zhang	University of Maryland, College Park
Ziyuan	Zhang	Washington University in St. Louis
Jingyi	Zhou	Duke University
Andrew	Ziegler	Penn State

3. Demographics of Students

The student body consisted of 39 male (72%), 16 female (24%) and 3 (4%) other gendered participants, for a total of 68 registered participants (a number of other local students and postdocs attended some lectures). Five of them were local MIT students. Students came from Poland, Korea, Germany and the US and were dominantly graduate students (two postdocs participated officially). Participants represented 40 different institutions. Significant effort went into ensuring a broad set of research interests within nuclear physics in the student body and our admission criteria heavily weighted a diverse student body (for example, the percentage of female participants was almost twice the percentage of female applicants).

4. Format of School

The school consisted of four 90-minute lecture periods per day. Each period was run by a single lecturer and most took a 5 to 10-minute break in the middle. There were two coffee breaks and a catered lunch break in between the four sessions on a day. Lunch and coffee were catered very close to the lecture hall and provided good opportunities for the students to interact with the lecturers and local organizing faculty.

The students were housed in dormitories at Boston University and provided with subway/bus passes for the duration. Unfortunately MIT did not have dorms available

for any external programs over summer due to renovation projects and Covid policies. The dorms provided a congenial atmosphere for the students for further discussions.

5. Social Events

The School began with a welcome reception held in the Sandberg Conference Centre at MIT. This was well attended by the students, lecturers and various MIT faculty. There was also a poster event on one of the evenings and some of the local students arranged weekend activities for interested visiting students.

6. Financial support from host and other organisations

MIT Physics provided \$30,000 support for the school and four national facilities (Brookhaven, Jefferson Lab and Oak Ridge National Laboratories, as well as the Facility for Radioactive Ion Beams) provided \$5,000 each for use by the school. With these contributions, we were able to support the travel of all students who indicated a need on their application. In most cases travel support was at the level of \$500 per student. Using MIT physics contributions, the school was also able to cover the childcare costs of one student who brought their young child to the school.

7. Observations, Comments, Suggestions

Having a central mailing list for advertising the conference that is maintained by INT would be very helpful.

One budgetary issue that we would like to see improved was that the main NSF/INT grant and the contributions we received from the various national labs were not able (according to our reading of the rules at least) to support childcare expenses for the student that requested this support. The additional flexibility of the local contributions did allow this, but for schools held at institutions without the ability to make such local contributions this would not be possible and would make the school less accessible to students who are parents.

