Ravi Chepuri

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Education

University of Maryland, College Park 2022—Present (Expected 2027)
Ph.D. Physics

Northwestern University 2018—2022
B.A. Physics, Math, and Integrated Science, *Magna Cum Laude*
Honors thesis: "A Scalable Architecture Towards Complex Quantum Communication Networks"

Research Experience

Graduate Student, University of Maryland 2022—Present
Department of Physics
Advisor: Professor Michelle Girvan

- Researching machine learning for time series prediction of complex systems
- Investigating effect of network structure of a reservoir computer (a type of recursive neural network) on prediction quality

This work is intended to serve as the basis for my eventual Ph.D. thesis research.

Undergraduate Researcher, Northwestern University 2020—2022
Department of Physics and Astronomy
Advisor: Professor István Kovács

- Introduced a theoretical model to create quantum communication networks on a lattice of interacting quantum spins
- Demonstrated numerically that these quantum networks can have substantial network complexity

This work led to a manuscript currently under review in Communications Physics and was funded by two undergraduate research grants at Northwestern University.

Publications

Chepuri R, Kovács IA. "Complex quantum network models from spin clusters." (*manuscript in peer review at Communications Physics*)

Presentations

Oral Presentations

Chepuri R, Kovács IA. "Complex quantum networks on a lattice of spins." **APS March Meeting**, 2023 Mar 5-10, Las Vegas, NV.

Poster Presentations

Chepuri R, Kovács IA. "Can we design a complex quantum network?" **International School and Conference on Network Science**, 2020 Sep 21-25, Rome, Italy (online).

Chepuri R. "A scalable quantum network architecture." **Northwestern Undergraduate Research and Arts Exposition**, 2020 May 27-28, online.

Awards and Grants

Integrated Science Program Departmental Honors 2022
- Honors thesis: "A Scalable Architecture Towards Complex Quantum Communication Networks"

Oliver Marcy Scholar 2022
- Best 3 Northwestern undergraduates in natural sciences

Fletcher Undergraduate Research Grant Award 2021
- Best Northwestern STEM undergrad research (faculty nomination, committee review)

Northwestern Advanced Summer Undergraduate Research Grant 2021
- $3500 for summer research based on research proposal, faculty committee review

Phi Beta Kappa Junior Inductee 2021
- Liberal arts and sciences honors society – top ~2% of Northwestern juniors

Sigma Pi Sigma Junior Inductee 2021
- Physics honors society

Outstanding Junior in Physics and Astronomy 2021
- Best 3rd year Northwestern physics major by coursework and faculty nomination

Weinberg College Summer Research Grant 2020
- $3500 for summer research based on research proposal

DAAD RISE Germany Scholarship 2020
- Scholarship from German Academic Exchange Service to research soft matter physics at Technische Universität Berlin (canceled, Covid-19)

Outstanding Sophomore in Physics and Astronomy 2020
- Best 2nd year Northwestern physics major by coursework and faculty nomination

Northwestern University Undergraduate Research Grant 2019
- $3500 for summer research based on research proposal, faculty committee review

Northwestern University Dean's List (12/12 academic quarters) 2018—2022
- Awarded based on GPA

Teaching Experience

Graduate Teaching Assistant, University of Maryland Fall 2022
Department of Physics
Courses: Fundamentals of Physics I
Responsibilities: Led introductory physics labs and discussion sections (~35 students). Lectured for weekly 15-minute review sessions. Developed quiz and discussion questions.

Undergraduate Teaching Assistant, Northwestern University Summer 2022
Department of Physics and Astronomy
Course: College Physics I
Responsibilities: Led discussion sections (~25 students), held weekly office hours, proctored and graded exams

Undergraduate Teaching Assistant, Northwestern University Fall 2021—Winter 2022
Department of Mathematics
Courses: Multivariable Differential Calculus (2 academic quarters)
Responsibilities: Led discussion sections (~25 students), held weekly office hours, proctored and graded exams

Mentoring Experience

Graduate Mentor, University of Maryland GRAD-MAP Jan 2023—Present
Mentor for Ciera Canady, Morgan State University undergraduate student
Responsibilities: Mentored undergraduate in a research challenge question as part of a workshop for undergraduates at HBCUs and minority serving institutions. Designed and created a pedagogical Python-based challenge question to create and analyze a numerical simulation of the Kuramoto model.

Peer Mentor, Northwestern Office of Undergraduate Research Winter 2020, Summer 2021
Responsibilities: Led weekly small group workshops for undergraduates interested in starting research. Facilitated student discussions about diversity and inclusion in STEM. Held individual check-ins with students supported by the Summer Undergraduate Research Grant.

Peer Adviser, Northwestern New Student and Family Programs Fall 2020
Responsibilities: Led orientation group for first-year Northwestern undergraduates.