

# N I R A J

## KUSHWAHA

### BASIC INFO

DOB	24/02/1997
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Twitter	<a href="https://twitter.com/nirajkkushwaha">https://twitter.com/nirajkkushwaha</a>

### CURRENT POSITION

<b>RESIDENT SCIENTIST / PHD CANDIDATE</b>	<b>2021-</b>
<i>Complexity Science Hub Vienna</i>   Josefstädter Str. 39, 1080 Vienna (Supervisor: Dr. Edward D. Lee, Prof. Stefan Thurner)	
<ul style="list-style-type: none"><li>• Discovering mesoscale for chains of armed conflicts</li><li>• Building dynamical models to explain population-level scaling in sessile organisms</li><li>• Joint affiliation with the Department of Physics, University of Vienna (Supervisor: Prof. Christoph Dellago)</li></ul>	

### EDUCATION

<b>MSc. in PHYSICS</b>	<b>2018-2020</b>
<i>Indian Institute of Technology (IIT) Indore</i>   Khandwa Rd, Simrol, Madhya Pradesh 453552	
<ul style="list-style-type: none"><li>• Thesis topic: "Engineering chimera and novel technique based on machine learning"</li><li>• Minor project on, "Crop classification using satellite imagery"</li><li>• Minor project on, "Credit card fraud detection"</li></ul>	
<b>BSc. in PHYSICS (HONS.)</b>	<b>2015-2018</b>
<i>Institute of Science- BHU</i>   Ajagara, Varanasi, Uttar Pradesh 221005	
<b>High school diploma</b>	<b>2014</b>
<i>Atomic Energy Central School</i>   Tarapur, India	

## INTERNSHIP

### MASTER THESIS INTERN

2019-2020

**Complex Systems Lab, IIT Indore** | Khandwa Rd, Simrol, Madhya Pradesh 453552

(Supervisor: Prof. Sarika Jalan)

- Worked on my master thesis for a year

### WINTER INTERN

2018

**Astrophysical Sciences Division, Bhabha Atomic Research Station** | Anushaktinagar, Mumbai - 400 094

(Supervisor: Mr. Bitan Ghosal)

- Main project topic: "Synchrotron emission by charged particles in a non-uniform magnetic field"
- Minor project on data analysis of radiation data from "Major Atmospheric Cerenkov Experiment Telescope"

## ACHIEVEMENTS

### National level exams

- Top 1% national level toppers (All India Rank=66) in National Graduate Physics Examination-2018
- All India Rank=432 in the national entrance exam for the Indian Institute of Technology in 2018

### Awards

- Significant Milestone Award of the 2023 Exner Lectures in the category of PhD by The Exner Foundation
- Gold medal in National Science Olympiad conducted by All India Science Teacher's Association

## PUBLICATIONS

### Articles

Kushwaha, Niraj and Edward D Lee (Aug. 2023). "Discovering the mesoscale for chains of conflict". In: *PNAS Nexus* 2.7, pgad228. issn: 2752-6542. doi: 10.1093/pnasnexus/pgad228.

Kushwaha, Niraj, Naveen Kumar Mendola, Saptarshi Ghosh, Ajay Deep Kachhvah, and Sarika Jalan (2021). "Machine learning assisted chimera and solitary states in networks". In: *Frontiers in Physics* 9, p. 513969.

## CONFERENCES

### THE GERMAN PHYSICS SOCIETY MEETING

2024

Berlin, Germany

- Gave a talk on "Conflict Classification Using Multinomial Mixture Models and Conflict Avalanches"

### CONFERENCE ON COMPLEX SYSTEMS

2023

Salvador, Brazil

- Gave two talks, "From Narrative to Systematic Scales of Conflicts" and "Systematic Procedure for Extracting Causal Connections in Conflict Cascades"

### NETSCI

2023

Vienna, Austria

- Volunteer with the organization team.

	<b>THE GERMAN PHYSICS SOCIETY MEETING</b> <i>Dresden, Germany</i>	<b>2023</b>
	<ul style="list-style-type: none"><li>Gave a talk on "Population waves in sessile organisms"</li></ul>	
	<b>CONFERENCE ON COMPLEX SYSTEMS</b> <i>Palma de Mallorca, Spain</i>	<b>2022</b>
	<ul style="list-style-type: none"><li>Gave a talk on "Multiscale causal structure in armed conflicts"</li><li>Presented a poster</li></ul>	
	<b>THE GERMAN PHYSICS SOCIETY MEETING</b> <i>Regensburg, Germany</i>	<b>2022</b>
	<ul style="list-style-type: none"><li>Gave a talk on "Multiscale causal structure in armed conflicts"</li></ul>	
	<b>CONFERENCE ON COMPLEX SYSTEMS</b> <i>Online</i>	<b>2020</b>
	<ul style="list-style-type: none"><li>Gave a talk on "Machine Learning assisted Chimera states in Networks"</li></ul>	
	<b>HARVARD COLLEGE US-INDIA INITIATIVE</b> <i>Mumbai, India</i>	<b>2017</b>
	<ul style="list-style-type: none"><li>Delegate</li></ul>	
<b>SCHOOLS AND WORKSHOPS</b>	<hr/>	
	<b>LIPARI SCHOOL ON COMPUTATIONAL COMPLEX AND SOCIAL SYSTEMS</b> <i>Lipari, Italy</i>	<b>2023</b>
	<b>LIPARI SCHOOL ON COMPUTATIONAL COMPLEX AND SOCIAL SYSTEMS</b> <i>Lipari, Italy</i>	<b>2022</b>
	<b>BIGSSS SUMMER SCHOOL IN COMPUTATIONAL SOCIAL SCIENCE</b> <i>Groningen, Netherlands</i>	<b>2022</b>
	<ul style="list-style-type: none"><li>Project topic: "Dynamical reciprocity in office spaces"</li></ul>	
	<b>THE GREAT RESIGNATION WORKSHOP</b> <i>Vienna, Austria</i>	<b>2022</b>
	<b>GLOBAL INITIATIVE OF ACADEMIC NETWORKS (GIAN) WORKSHOP</b> <i>Indore, India</i>	<b>2018</b>
	<ul style="list-style-type: none"><li>Topic of workshop: "Network Science- from structure to dynamic"</li></ul>	
<b>MEDIA</b>	<hr/>	
	<b>Articles</b> <ul style="list-style-type: none"><li>The Military’s Recruitment of AI Has Already Begun</li><li>Forscher beobachten "Lawinen" bei Ausbreitung bewaffneter Konflikte</li><li>Scientists develop method to predict the spread of armed conflicts</li></ul>	

## OTHER ACTIVITIES

### Audio/Video

- Gave a live interview at the BBC newscast radio show.
- Our paper was featured in Sabine Hossenfelder's science news.

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### Positions of Responsibility

- **PhD representative** at the Complexity Science Hub Vienna (one term)
- **Climate counsellor** appointed by the International Centre for Culture and Education at BHU (one term)
- **House captain** during school (one year)
- **House sports captain** during school (one year)
- **House prefect** during school (two years)

### Volunteering Work

- Volunteered at the Buddy Project, Vielmehr für Alle! in Vienna
- Started an NGO with college friends at BHU to educate underprivileged kids in Varanasi

### Select Online Courses

- "Network Dynamics of Social Behaviour" by University of Pennsylvania
- "From big bang to dark energy by Prof. Hitoshi Murayama" by University of Tokyo
- "Social Norms, Social change" by UNICEF
- "Digital media marketing" by Internshala

### Model United Nations Conferences

- Attended the "BHU-Model United Nations conference, 2016"
- Attended the "Ganges model united nations, 2017"
- Attended the 'Malviya national youth parliament 2017"