

# CURRICULUM VITAE

SWATI SHARMA



Ph.D. (Seismology)

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33, Female

Date of Birth : September 20, 1988  
Nationality : Indian  
Parentage : D/o Sh. Bishan Dass Sharma  
& Smt. Surishta Sharma  
Current area of research : Seismology (Geophysics)

## **CURRENT RESEARCH:**

**Curent Position** : PDF at IISER Kolkata  
**Topic of Research** : “**Seismological imaging of the lithospheric mantle discontinuities**”  
**Date of employment** : **14-01-2022**

## **RESEARCH SUMMARY**

My research till date covers

- Imaging the crust and upper mantle shear-wave velocity structure of the Jammu and Kashmir Himalaya, at NW end of Himalayan Arc. Determination of depth of velocity boundaries with multiple approaches using radial P-RFs, mainly H-Vp/Vs stacking technique, Common Conversion Point (CCP) stacking and Joint modeling of P-RFs with surface wave dispersion data, on the data acquired of local network JAKSNET installed in the region.
- Studying attenuation characteristics of the continental lithospheric structure.
- Studying seismotectonics with special interest to understand the tectonics of the region and interaction of Himalayan wedge with the underthrusting Indian crust, in the active continent-continent collisional zone.
- Deployment of 28 broadband seismographs and retrieval of seismic data for maximum of 7 years, under the networks JAKSNET and HPSNET ([Sharma et al., 2020](#)), in the remote areas of Jammu and Kashmir and Himachal Himalaya, comprising the zone of Kashmir Seismic Gap. Deployments covered for over 7 years in subsequent installments under multiple projects funded through collaborative research projects between Shri Mata Vaishno Devi University (SMVDU), Indian Institute of Science Education and Research Kolkata (IISER-K) and University of Cambridge, UK.
- Noise characteristics of the broadband sites under JAKSNET.

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## RESEARCH INTEREST

My interest is mainly in studying crust and upper mantle of the Himalaya. I have interest in studying the structure and style of deformation of the solid part and in understanding the dynamics of the coupling between lithosphere-asthenosphere. I am also interested in studying earthquake mechanisms and the tectonics of the region. This can be approached with various geophysical methodologies and their combinations which can be used in conjunction with geodetic, geological or gravitational methods.

I focus in the region of Jammu and Kashmir and the nearby Himachal Pradesh, at the northwestern end of Himalaya.

However my research is not bound to only these topics. At present I am focusing on gaining literature background of the crust and upper mantle anisotropy of the NW of Himalaya. I am willing to work on understanding of the anisotropy in the region, and develop an understanding of the style of deformation at the western end of Himalayan Arc.

## EDUCATIONAL BACKGROUND

- **Ph.D. (Seismology)**, Shri Mata Vaishno Devi University, Katra 2013-20  
Thesis "Crust and Upper Mantle Studies of J&K Himalayas"  
Supervisor: Dr. S.K. Wanchoo (SMVDU Katra); Prof. Supriyo Mitra (IISER Kolkata)
- **M.Sc. Physics**, Shri Mata Vaishno Devi University, Katra (8.76 CGPA) 2009-11  
Masters Project "Wireless communication using IR link (PC to microprocessor kit)
- **B.Sc. (Non-Med)**, Govt. Degree College, Kathua 68.42% 2006-09
- Higher Secondary (12<sup>th</sup>), CBSE 70.8% 2006
- Senior Secondary (10<sup>th</sup>), CBSE 73% 2004

## WORK IN PROGRESS

- "Imaging lithosphere beneath Jammu and Kashmir Himalaya, in the Northwest" article manuscript in progress, to be submitted for publication in the second half of year
- "The sub-surface structure and the seismotectonics of the Northwest Himalaya" article manuscript in progress, to be submitted for publication by the end of year
- New broadband seismograph deployments, towards expansion of the **Jammu and Kashmir Seismological Network** (JAKSNET) and **Himachal Pradesh Seismological Network** (HPSNET).

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## **EXPERIENCE**

### **EDUCATIONAL**

– Ph.D. Graduate (Shri Mata Vaishno Devi University, Katra, J&K, India)

Experience – 8 years (2013-2020)

I am PhD graduate from Shri Mata Vaishno Devi University, Katra (J&K) under the supervision of Dr. Sunil Kumar Wanchoo at SMVDU, Katra and Prof. Supriyo Mitra at IISER Kolkata. My PhD thesis titled “**Crust and Upper Mantle Studies of J&K Himalayas**” (<https://shodhganga.inflibnet.ac.in/handle/10603/316323>) is aimed to understand the crust and upper mantle structure and seismotectonics of the region, primarily of Jammu and Kashmir Himalaya and the nearby Himachal Himalaya, covering Kashmir Seismic gap. Kashmir seismic gap, in the North-West Himalaya, is a widely known seismic gap with high seismic hazard but also a least understood region.

Apart from this I have undertaken extensive field work, which involved reconnaissance, site building, deployment and off-line monitoring. The broadband network was time-to-time maintained over a period of 7 years. And the servicing of these instruments (offline) was as frequent as every month to two, for each site alongside the lab-work and data analysis.

#### **– Summer Project student**

Experience - 5 months (June-Oct, 2013)

I have worked on a project titled “**Measurement and analysis of surface deformation of Jammu and Kashmir (J&K) Himalayas**” with Prof. V.K Gaur, Dr. Sridevi Jade at IIA, CSIR-4PI (formerly C-MMACS), and Dr. S.P. Satyabala at IISc Bangalore. The project was undertaken under IASc-INSa-NASI summer fellowship, for 2<sup>nd</sup> June to 3<sup>rd</sup> of November, 2013.

The goal was to learn theoretical foundations of the analytical framework required to study the ground deformation field and gain the proficiency in learning the technique to measure the surface displacement field in the Jammu and Kashmir Himalayas using Global Positioning System (GPS).

The project also aimed to learn processing GPS information and analysis of data to model the lithospheric process in the region. A major objective is to determine the strain distribution along the Main Himalayan Fault, the slip plane along which Tibet advances southward over the India, and model of Himalayan convergence in this segment of the Himalaya Arc.

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## **FIELD EXPERIENCE**

Experience ~ 7 years (2014-2020)

My experience mainly includes geophysical field for over 7 years, mainly in deploying and monitoring the seismic broadband network. The field, broadly focused on setting up a local seismic broadband network in the Union Territory of Jammu and Kashmir and the state of Himachal Pradesh, encompassing a prominent seismic gap, in the NW segment of Himalaya.

This included set-up, operation and control and maintenance of a seismic network of over 28 broadband seismographs. The work done, majorly includes

- Site reconnaissance surveys and selection of least noisy sites.
- Installations of the instruments (broadband seismometers).
- Maintenance and data retrieval from the deployed stations.

The field work is always facilitated with pre-installation testing of seismographs, carried for long hours, on and off the site. This also includes testing and repairing of all the equipments, many a times, keeping the atmospheric conditions in monitor.

Most of the sites are deployed in remoteness, to ensure minimum of cultural noise, and thus has increased hardships and access. However time to time visits were made for ~7 years with main focus towards activities required to ensure the continuous functioning of instruments to avoid data gaps. We have currently 29 broadband seismographs progressively deployed in the NW Himalaya, one of the biggest in the region, till date, with few underway. The details are in ([Sharma et al., 2020](#)).

### Instrumentation experience

- Monitored and gathered SAC data for over period 7 years (in offline mode).
- Familiar with seismic data retrieving and handling associated tools.
- Also have hands on experience in pre-installation setting up and fixing of broadband seismographs in the field as well as in the lab.

## **RESEARCH TRAINING:**

- Attended CSIR-4PI, IIA and IISc. Bangalore, under the supervision of Prof. V.K.Gaur, Prof. S. P. Satyabala and Dr. Sridevi Jade under IASc-INSa-NASI summer fellowship, 2013. This research training of five months (originally two months later extended to five months) was intended to get basics and hands on of methods and seismology and geodetic techniques of hazard quantification also the basic theory behind these techniques.
- Attended Bullards Laboratory, University of Cambridge, for four weeks in 2015 and in 2017 and worked under the supervision of Prof. Keith Priestley as a part of UK-IERI student exchange programme.

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## PUBLICATIONS/PRESENTATIONS

### Articles in refereed journals

- 1 Himanshu Agrawal, Supriyo Mitra, [Swati Sharma](#), Sunil Kumar Wanchoo, Keith F. Priestley, Christian Haberland, 3D velocity structure and earthquakes beneath Jammu and Kashmir Himalaya. **Geophysical Research Letters**, 2021 (under review).
- 2 [Swati Sharma](#), Supriyo Mitra, Shubham Sharma, Keith Priestley, Sunil K. Wanchoo, Debarchan Powali, Liyaqet Ali, A Report on Broadband Seismological Experiment in the Jammu and Kashmir Himalaya (JAKSNET). **Seismological Research Letters** (2020). <https://doi.org/10.1785/0220190389>
- 3 Himangshu Paul, Keith Priestley, Debarchan Powali, [Swati Sharma](#), Supriyo Mitra and Sunil Wanchoo, Signatures of the existence of frontal and lateral ramp structures near the Kishtwar Window of the Jammu and Kashmir Himalaya: Evidence from microseismicity and source mechanisms. **Geochemistry, Geophysics, Geosystems**, Volume 19, Issue 9, pp. 3097-3114, 2018. <https://doi.org/10.1029/2018GC007597>

### Conference Abstracts

- 1 Supriyo Mitra, [Swati Sharma](#), Debarchan Powali, Keith Priestley and Sunil Wanchoo, Crustal Structure and Earthquakes beneath the Jammu and Kashmir Himalaya, **EGU General Assembly** 2020, European Geosciences Union General Assembly, 2020, EGU2020-4012.
- 2 [Priestley, K. F.](#); [Mitra, S.](#); [Sharma, S.](#); [Powali, D.](#); Wanchoo, S. K.; Crustal Structure and Earthquakes beneath the Jammu and Kashmir Himalaya, **AGU Fall Meeting** Abstracts, T43A-08, 2019.  
<https://ui.adsabs.harvard.edu/abs/2019AGUFM.T43A..08P>
- 3 [Swati Sharma](#), Debarchan Powali, Supriyo Mitra, S. K. Wanchoo and K. Priestley, Lithospheric Structure and Earthquakes beneath Jammu and Kashmir Himalaya, Geophysical Research Abstracts, Vol. 20, EGU2018-11932, 2018, **EGU General Assembly** 2018, European Geosciences Union General Assembly, Vienna, 8<sup>th</sup>-13<sup>th</sup> April, 2018. <https://meetingorganizer.copernicus.org/EGU2018/EGU2018-11932.pdf>
- 4 [Swati Sharma](#), Debarchan Powali, Supriyo Mitra, S. K. Wanchoo and K. Priestley, Crustal Structure of Jammu and Kashmir Himalaya, Eos Trans. **AGU, Fall Meet.** Suppl., Abstract T23B-2919, American Geophysical Union meeting, San Francisco, 11-15 Dec., 2016. <http://abstractsearch.agu.org/meetings/2016/FM/T23B-2919/author1.html>
- 5 Debarchan, Powali, [Sharma, Swati](#), Mitra, S., Priestley, K., Wanchoo, S.K., Priestley, K.F. and Gaur, V.K. Lithospheric Structure and Earthquakes beneath Kashmir Himalaya, Eos Trans. **AGU, Fall Meet.** Suppl., Abstract T21B-4587, American Geophysical Union meeting, San Francisco, 15-19 Dec., 2014. <http://adsabs.harvard.edu/abs/2014AGUFM.T21B4587W>

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## Presentations

- 1 Have presented a poster titled “LITHOSPHERIC STRUCTURE AND EARTHQUAKES BENEATH JAMMU AND KASHMIR HIMALAYA” (TS5.5/SM2.11) in **European Geo-Sciences Union General Assembly** 2018, 8<sup>th</sup>-13<sup>th</sup> of April, 2018 in Vienna, Austria.
- 2 Have presented a poster titled “DELINEATING CRUSTAL STRUCTURE IN JAMMU AND KASHMIR HIMALAYA: CONSTRAINTS FROM RECEIVER FUNCTIONS” in **JK Science Congress**, 2017 at University of Jammu, held for 2<sup>nd</sup>-4<sup>th</sup> March, 2017.
- 3 Have presented a poster titled “CRUSTAL STRUCTURE BENEATH JAMMU AND KASHMIR HIMALAYA” in **National Geo-Research Scholars Meet** (NGEORS), 2016 held at Wadia Institute of Himalayan Geology (WIHG), Dehradun (India).
- 4 Have presented the research work titled “IMAGING THE MOHO STRUCTURE BENEATH NORTH-WESTERN HIMALAYA” at **DST-SERB training Programme** “Earthquake Hazard: Basic Approaches, Field Investigations and Modeling” hosted by SMVD University, Katra (India), 2015.
- 5 Another poster of title “LITHOSPHERIC STRUCTURE AND EARTHQUAKES BENEATH KASHMIR HIMALAYA” was presented in **AMERICAN GEOPHYSICAL UNION** fall meeting, 2014.
- 6 I have presented a poster along with the other group members at the **Science Academics’ Interdisciplinary lecture Workshop** “PHYSICS OF EARTHQUAKES AND HAZARD ANALYSIS” (27-29<sup>th</sup> May, 2014) and **United Kingdom India Education and Research Initiative (UK-IERI) funded workshop** ‘EARTHQUAKE HAZARD QUANTIFICATION IN NW HIMALAYA’ (30<sup>th</sup> May, 2014).

## CONFERENCES/WORKSHOPS/TRAININGS ATTENDED

- **EUROPEAN GEO-SCIENCES UNION** General Assembly 2018, 8<sup>th</sup>-13<sup>th</sup> of April, 2018, Vienna, Austria.
- **JK SCIENCE CONGRESS**, 2017, 2<sup>nd</sup>-4<sup>th</sup> March, 2017, University of Jammu (India),
- 2016 **GIAN COURSE** on “Active Continental Tectonics” by Prof. James Jackson, 6<sup>th</sup>-9<sup>th</sup> of November, 2016, IISER Kolkata (India).
- National **GEO-RESEARCH SCHOLARS MEET**, 2016, 1<sup>st</sup>-4<sup>th</sup> of June, 2016, Wadia Institute of Himalayan Geology (WIHG), Dehradun (India).
- DST-SERB training Programme ‘**EARTHQUAKE HAZARD: BASIC APPROACHES, FIELD INVESTIGATIONS AND MODELING**’, 10<sup>th</sup>-16<sup>th</sup> of November, 2015, SMVD University, Katra (India).
- Science Academics’ Interdisciplinary lecture workshop ‘**PHYSICS OF EARTHQUAKES AND HAZARD ANALYSIS**’, 27<sup>th</sup>-29<sup>th</sup> May, 2014, SMVD University, Katra (India).
- United Kingdom India Education and Research Initiative (UK-IERI) funded workshop ‘**EARTHQUAKE HAZARD QUANTIFICATION IN NW HIMALAYA**’, 30<sup>th</sup> May, 2014, SMVD University, Katra (India).
- 101<sup>ST</sup> **INDIAN SCIENCE CONGRESS**, 2014, 3<sup>rd</sup>-8<sup>th</sup> of February, 2014, University of Jammu (India).

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## **OTHER EXPERIENCES**

### **Volunteering Experience**

I have volunteered in team of organising INSPIRE programmes since 2011, held under DST, GOI in various parts of Jammu and Kashmir during this period till 2018, mainly in Jammu and Ladakh region.

I have volunteered for Science Academics' Interdisciplinary lecture Workshop "PHYSICS OF EARTHQUAKES AND HAZARD ANALYSIS" (27-29<sup>th</sup> May, 2014) and United Kingdom India Education and Research Initiative (UK-IERI) funded workshop 'EARTHQUAKE HAZARD QUANTIFICATION IN NW HIMALAYA' (30<sup>th</sup> May, 2014) organised by SMVD University.

I have also volunteered in another, a DST-SERB sponsored training programme on 'EARTHQUAKE HAZARD BASIC APPROACHES, FIELD INVESTIGATIONS AND MODELING at SMVDU, Katra, J&K from 10-16<sup>th</sup> November 2015.

And in few of the public outreach programmes in the state, in Jammu and Kashmir.

### **AWARDS:**

- DST-INSPIRE Fellowship under AORC scheme (JRF + SRF)
- IASc-INSa-NASI Summer fellowship, 2013.
- INFOSYS award for 1<sup>st</sup> rank in M.Sc.

### **SUPPORT:**

- SERB-ITS travel grant 2018, for attending EGU, 2018

## **SUBJECT STUDIED IN MASTERS**

Classical Mechanics, Statistical Mechanics, Quantum Mechanics, Mathematical Physics, Nuclear and Particle Physics, Atomic and Molecular Physics, Laser and Plasma Physics, Condensed Matter Physics, Electrodynamics, Computational Physics, Electronics, Solid State Electronics, Microprocessor and Micro-controller and their Interfacing, VHDL and Networking.

SPECIALIZATION: Electronics

PROJECT (M.Sc.): Wireless communication using IR link (for Masters Thesis). For demonstration it was done in between PC & 8085- microprocessor kit.

## **PERSONAL SKILLS**

I believe I am enthusiastic and have comprehensive problem solving abilities. Am willing and happy to work in groups. I am capable of extensive field work, have done field work in the tough terrains of Jammu and Kashmir and Himachal for past seven years and still continuing. I am also able to work for long hours in lab as well as field, and am wishful to devote time to research and teaching for whole of my life.

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## **REFERENCES**

- 1 Dr. S. K. Wanchoo  
Associate Professor,  
School of Physics  
Shri Mata Vaishno Devi University, Katra (J&K), India  
Email: [sunil.wanchoo@smvdu.ac.in](mailto:sunil.wanchoo@smvdu.ac.in)
- 2 Prof. Supriyo Mitra  
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Department of Earth Sciences  
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- 4 Prof. V. K. Gaur, FNA, FNASc, FTWAS  
Honorary Professor,  
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