

# Curriculum Vitae of Dr. Sujay Pal

## PRESENT STATUS

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**Assistant Professor** (from December 2019)

Department of Physics

Srikrishna College, Bagula, Nadia, Affiliated to University of Kalyani

Guest Faculty, Department of Atmospheric Sciences, University of Calcutta (2020- )

And also associated with the Near-Earth Space and Atmospheric Observatory (NESAO)

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## DETAILS OF EDUCATION

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**Ph.D.** in Physics from the University of Calcutta, worked at S N Bose National Centre for Basic Sciences, Kolkata (Thesis submitted on 8<sup>th</sup> May, 2013, Degree awarded on 2<sup>nd</sup> January, 2014)

**Specialization:** Space Physics

**Supervisor:** Prof. Sandip K. Chakrabarti, S N Bose National Centre for Basic Sciences, Kolkata

**M. Sc.** in Applied Physics, Indian Institute of Engineering Science and Technology (IEST)

August 28, 2006 to August 18, 2008

**Specialization:** Material Physics, Physics of Semiconductor Devices

**B.Sc.** in Physics (Honors), Hooghly Mohosin College under the University of Burdwan

August 20, 2003 to July 25, 2006

## OTHER QUALIFICATIONS

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- ✚ **Post M. Sc. Graduate Course**, 2008 - 2009, S N Bose National Centre for Basic Sciences; Subjects: Advanced Quantum Mechanics, Statistical Mechanics and Project.
- ✚ **Ph.D. Course Work**, 2010 - 2011 according to the University Grant Commission (UGC) rule; Subjects: Review work & Research Methodology, Astrophysics & Project.
- ✚ National Eligibility Test (NET) in Physical Sciences with **CSIR-JRF**, 2009
- ✚ Qualified **GATE** and **JEST** in Physical Science

## POST-DOCTORAL EXPOSURE/JOB EXPERIENCE

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**UGC-Dr. D. S. Kothari Fellow**

Department of Atmospheric Sciences

University of Calcutta, From Feb. 2018- December 2019

**Assistant Professor in Physics**, March 2017 to February, 2018

Department of Basic Science & Humanities

Gargi Memorial Institute of Technology (GMIT), Baruipur, Kolkata 700144

- **Post-doctoral Research Assistant-II**, October 2015 to March 20, 2017  
Department of Ionospheric Sciences  
Indian Centre for Space Physics, Kolkata 700084
- **Assistant Professor**  
Department of Communication Engineering & Informatics  
University of Electro-Communication,  
Chofu, Tokyo, Japan, 1<sup>st</sup> Aril, 2014 to –September 30, 2015.
- **Project Scientist (MoES)**  
Department of Ionospheric Sciences  
Indian Centre for Space Physics, Kolkata-700084, from July, 2012 – March, 2014.

## RESEARCH INTERESTS

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- Radio remote sensing study of the atmosphere and near-Earth space environment (Theory & Experiment)
- Atmospheric and Space Electricity
- Total Lightning, Thunderstorms & Severe Weather
- Space Weather, Magnetosphere
- AI/ML Application

## AWARDS/HONORS/FELLOWSHIP

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- ✚ The **SERB** Start Up Research Grant (SRG), 2020.
- ✚ The **UGC-Dr. D. S. Kothari** Post-doctoral Fellowship, 2018-21.
- ✚ **One of Outstanding Paper Award** in the 3<sup>rd</sup> Regional Science and Technology Congress (Western Region), organized by the Department of Higher Education, Science and Technology and Biotechnology, Govt. of West Bengal, December 20-21, 2018.
- ✚ The **URSI (International Union of Radio Science) Young Scientist Award**, AT-RASC, 2015, Gran Canaria, Spain.
- ✚ **Assistant Professor** at the **University of Electro-Communication, Tokyo, Japan** from April 2014 to September 2015.
- ✚ The **University Medal**, 2009 in Applied Physics, Bengal Engineering & Science University (IEST)
- ✚ **Junior Research Fellow**, 1<sup>st</sup> August 2008 – 30<sup>th</sup> July 2010, S. N. Bose National Centre for Basic Sciences, Kolkata
- ✚ **Senior Research Fellow**, 1<sup>st</sup> August 2010 – 30<sup>th</sup> June 2012, S. N. Bose National Centre for Basic Sciences, Kolkata

## TRAVEL GRANT AWARDS

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- Received the **Roland-Schlich Travel Award for Early Career Scientist** from the European Geosciences Union (EGU) for the EGU 2019 General Assembly, Vienna, Austria.
- Received the **CSIR** travel grant for attending the **European Geosciences Union (EGU)**

**General Meeting 2019**, held at Vienna, Austria from April 7 –April 12, 2019.

- **SERB Travel Award for Young Scientist** to attend the **Polar Upper Atmosphere: from Science to Operational Issues**”, held in L’Aquila, Italy, September 17-21, 2018, organized by the International School of Space Science (ISSS), Italy and also a partial travel support in terms of reduced registration fee from **the School Organizing Committee**.
- Selected for the Young Scientist Travel Grant for the **ESPAS (near earth space data infrastructure for e-science) Training School in Warsaw, Poland**, October- 2015 (not attended due to visa problem).
- Student Travel Grant Recipient from the Committee on Space Research (COSPAR) to participate in the **39<sup>th</sup> COSPAR Assembly 2012, Mysore, India**

#### MEMBERSHIP OF PROFESSIONAL BODIES

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- 1) **Individual Membership (MURSI)** of International Union of Radio Science (**URSI**), MURSI No. M1810285331, Ghent, Belgium.
- 2) Member of **Indian Radio Science Society (InRaSS)**, New Delhi, India, 2019-
- 3) Regular Membership of the European Geosciences Union (**EGU**), Munich, Germany, 2019-
- 4) Regular Membership of the American Geophysical Union (**AGU**), Washington, D.C., United States, 2020-
- 5) Life Member (L2306) of Astronomical Society of India (**ASI**), Hyderabad
- 6) Life Member of the Indian Association of Physics Teachers (**IAPT**), Kanpur, India
- 7) Life Member of Indian Centre for Space Physics (**ICSP**), Kolkata
- 8) Associate of **COSPAR** (Committee on Space Research), Paris, France.

#### JOURNAL REVIEWER

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*Journal of Atmospheric and Solar-Terrestrial Physics (JASTP), Journal of Geophysical Research (JGR-Space), Advances in Space Research (ASR), Radio Science, Geophysical Research Letter (GRL), ANGIO*

#### ACADEMIC VISIT FOR RESEARCH COLLABORATION

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- 1) Visit to **University of Electro-Communication, Tokyo, Japan** from **23<sup>rd</sup> June, 2018 to 7<sup>th</sup> July, 2018** to work with Prof. Y. Hobara on atmospheric electricity and radio remote sensing projects.
- 2) Department of Physics, Cooch Behar Panchanan Barma University, West Bengal, September, 2019.

**M.SC. PROJECT/DISSERTATION SUPERVISED: 6, SUMMER INTERN: 1**

**PH.D SUPERVISION: 2** (ongoing)

### **PROJECT ONGOING/COMPLETED:**

- 1) Principal Investigator of the Project No. SRG/2020/001104 funded by the **SERB** under the Scheme of **Start-up Research Grant** for Young Scientist, 2020-2022, Duration- 2 years, Status: Ongoing.
- 2) Co-Principal Investigator of the Project No. 0258/RND/ESGI/CU16/Mar-2021/1/1 funded by **WBDSTBT**, 2021-23, Duration- 3 years, Status: Ongoing.
- 3) Principal Investigator of the Project No: F.4-2/2006(BSR)/ES/17-18/0007, funded by **UGC** under the DSKPDF Scheme, Fund utilized: 2.0 lakhs from 26/02/2018 to 16/12/2019. Status: Completed.

### **SEMINAR/CONFERENCES/SCIENTIFIC MEETING ORGANIZED:**

- 4) Organized a National “**Workshop on Weather and Climate: Data Analysis and Application**” jointly with Department of Atmospheric Sciences (DAS), University of Calcutta, Kolkata, February 17-18, 2020, Sponsored by Srikrishna College & DAS, CU.
- 3) **Joint Convenor** of the scientific session EFGH4 entitled “**EM Noise and Radio Remote Sensing Applications in Terrestrial and Planetary Environment**” in the **URSI Asia Pacific Radio Science Conference, (APRASC-2019)** New Delhi.
- 2) Member of Organizing Committee (Secretary) for the 1<sup>st</sup> **National Conference on Severe Weather (NCSW-2019)**, 17-19 March, 2019 organized by the Department of Atmospheric Sciences, University of Calcutta.
- 1) Member of Local Organizing Committee in 1st International Conference on Very Low Frequency (VLF) Radio Waves: Theory & Observations (**VELFRATO-10**), 13th to 18th March, 2010, S. N. Bose National Centre for Basic Sciences, Kolkata, India.

### **HIGHLIGHTS OF RESEARCH WORK:**

- 1) Radio waves reveal birth of gravity waves during solar eclipse, natureindia, doi:10.1038/nindia.2015.28, published online 26 February 2015.
- 2) Measuring the effect of Sudden Stratospheric Warming on radio signals, Editor’s highlight, Journal of Geophysical Research- Space Physics, July 2017, <http://agupubs.onlinelibrary.wiley.com/hub/article/10.1002/2016JA023813/editor-highlight>

**Number of publication: International Journals: 22**

**Peer-reviewed international proceedings as full paper/Book Chapters: 21**

### **SEMINAR/CONFERENCE/SYMPOSIUM PRESENTATION**

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#### **Invited Talks:**

- 1) Delivered an invited talk entitled “Mid-latitude D-region ionospheric disturbances during some of the major SSW events in the northern polar region observed through low frequency radio signals”

at the 50<sup>th</sup> **Anniversary International Symposium of Centre for Space Science and Radio Engineering (SSRE) of the University of Electro-Communication, Tokyo, Japan** during 25-26 June, 2018.

- 2) India's Space Success and Chandrayaan, in a seminar on "50 Years of Moon Landing", 8<sup>th</sup> August, 2019, Harnasra High School, Bankura.

**Contributed Talks/Posters:**

24) Presented a paper titled "Effects of thunderstorms on the lower ionosphere as observed by VLF radio signals" in the **AGU (American Geophysical Union) Fall Meeting 2020**, 1-17 December 2020 (online).

23) Presented an *invited* paper titled "Response of the mesosphere and lower ionosphere to the Extremely Severe Cyclone 'Fani' of 2019 over the North Indian Ocean" in the **URSI GASS 29** August – 05 September 2020, Rome, Italy (web version).

22) Participated in the **4<sup>th</sup> Regional Science & Technology Congress (Southern Region)**, West Bengal on 23-24 December, 2019 and presented a paper. (Poster)

21) Participated in the Young Scientist Conference as a part of "**India International Science Festival-2019**", Kolkata, November 5-8, 2019 and presented a paper on the theme 'Frontier Areas of Research'. (Poster)

20) High latitude and mid-latitude ionospheric disturbances associated with some major stratospheric warming events in the Northern hemisphere, **EGU General Assembly 2019**, Vienna, Austria, 7-12 April, 2019. (Oral)

19) A study of total lightning characteristics of thunderstorms over Gangetic West Bengal, **URSI-APRASC**, New Delhi, 09-15 March, 2019. (Oral)

18) Total lightning activity during Nor'wester events over Gangetic West Bengal, **3<sup>rd</sup> Regional Science and Technology Congress (Western Region)**, Sidho Kanho Birsa University organized by the Department of Higher Education, Science and Technology and Biotechnology, Govt. of West Bengal December 20-21, 2018. (Oral)

17) Sub-ionospheric VLF/LF signal disturbances associated with the major sudden stratospheric warming event of 2009, Atmospheric electricity phenomena and Natural Hazards, University of Calcutta on 5th May, 2017. (Oral)

16) Atmosphere and ionosphere connection as revealed by the network observation of Very Low Frequency radio signals, **The URSI-Japan Radio Science Meeting (URSI-JRSM 2015)**, September 3-4, 2015, Tokyo Institute of Technology, Japan (Poster).

15) Relationship between nighttime VLF amplitude and total column Ozone data: Possibility of monitoring atmospheric Ozone from VLF remote sensing, **1<sup>st</sup> URSI Atlantic Radio Science Conference (AT-RASC 2015)**, May 18-22, 2015, Gran Canaria, Spain (Oral presentation).

14) Remote Sensing of Atmospheric Gravity Waves (GWs) and Planetary Wave Type Oscillations (PWTOs) in the upper mesosphere-lower ionosphere system using the Very Low

Frequency transmitter data, **31<sup>st</sup> URSI General Assembly and Scientific Symposium**, 16-23 August, 2014, Beijing, China (Poster presentation).

13) Low latitude sub-ionospheric VLF signal behavior during the two recent solar eclipses: observation and simulation, **31<sup>st</sup> URSI General Assembly and Scientific Symposium**, 16-23 August, 2014, Beijing, China (Poster presentation).

12) Characteristics of lightning associated transient perturbations in low latitude VLF paths, **31<sup>st</sup> URSI General Assembly and Scientific Symposium**, 16-23 August, 2014, Beijing, China (Poster presentation).

11) Possible relation between the night time VLF amplitude and total Ozone variation, **91<sup>st</sup> workshop of Japan Society of atmospheric electricity**, Gunma University, Japan, July 11-12, 2014 (Oral presentation).

10) Modeling of sub-ionospheric VLF signal perturbations associated with total solar eclipse 2009 in Indian subcontinent, **39<sup>th</sup> COSPAR Scientific Assembly (Session C0.4)** in Mysore, India during 14 - 22 July 2012 (Oral presentation).

9) First Ever VLF Monitoring of Lunar Occultation of a Solar Flare during the 2010 Annular Solar Eclipse and its effects on the D-region Electron Density Profile, **39<sup>th</sup> COSPAR Scientific Assembly (Session C1.1)** in Mysore, India during 14 - 22 July 2012 (Poster presentation).

8) Multi-satellite observation of Lunar Occultation of X-ray emission from a Solar Flare during the 2010 Annular Solar Eclipse, **39<sup>th</sup> COSPAR Scientific Assembly (Session E2.6)** in Mysore, India during 14-22 July 2012 (Poster presentation).

7) Modeling of Sub-ionospheric VLF Signal Perturbations associated with Total Solar Eclipse-2009 in India, **Indo-US Workshop on Advancing VLF Science through the Global AWESOME Network**, in Goa, India during 28 Nov-01 Dec, 2011 (Poster presentation).

6) Modeling VLF signal amplitudes over Indian sub-continent during the total solar eclipse, **XXX URSI General Assembly and Scientific Symposium of International Union of Radio Science**, 13-20 August, 2011, Istanbul Lutfi Kirdar Covention and Exhibition Centre, Istanbul, Turkey (Poster presentation).

5) Computation of amplitude and phase of VLF radio waves: Results from comparative study between wave-hop and waveguide mode theory, **XXX URSI General Assembly and Scientific Symposium of International Union of Radio Science**, 13-20 August, 2011, Istanbul Lutfi Kirdar Covention and Exhibition Centre, Istanbul, Turkey (Poster presentation).

4) Numerical Modelling of VLF Radio Wave Propagation and Comparison with Observations, **International workshop on Seismo-Electromagnetics and Atmospheric Science (IWSE AS-2010)**, 16-18 November, 2010, Hotel Marina, Agra, India (Poster presentation).

3) Theoretical study of the Diurnal and Seasonal behaviour of VLF signals using wave-hop theory and waveguide mode theory, **AOGS 2010, 7<sup>th</sup> Annual Meeting and Geosciences World Community Exhibition**, 5-9 July, 2010, Hyderabad International Convention Centre, India (Oral presentation).

2) Theoretical study of the Diurnal and Seasonal behaviour of VLF signals and comparison with VLF campaign data, **First International Conference on Science with Very Low Frequency Radio Waves: Theory and Observations**, Kolkata, India, March 13-18, 2010 (Oral presentation).

1) Theoretical study of the diurnal behaviour of the VLF signals and comparison with VLF campaign data, **The Sharjah-Stanford AWESOME VLF Workshop**, College of Sciences, University of Sharjah, UAE, Feb. 22-24, 2010 (Oral presentation).

#### RESEARCH TRAINING AND PARTICIPATION IN SCIENTIFIC ACTIVITIES

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9) Radar Training Workshop (Commission F), March 10, 2019, APRASC Pre-Conference Workshop, New Delhi.

8) Global Navigation Satellite System (GNSS) Workshop, March 09, 2019, APRASC Pre-Conference Workshop, Prithvi Bhavan, MOES, New Delhi

7) Participated in the “Brainstorming meeting on Stratosphere-Troposphere Radar”, Organized by the Institute of Radio Physics and Electronics, University of Calcutta, 18-19 January, 2019, Kolkata and presented research plan.

6) Participated in the “**The Polar Upper Atmosphere: from Science to Operational Issues**”, held in L’Aquila, Italy, September 17-21, 2018, organized by the International School of Space Science (ISSS), Italy.

5) Participated in the “**Workshop on Satellite Navigation and Application of GNSS/NavIC**” during 05-06 April, 2018 organized by the National Atmospheric Research Laboratory (NARL), Gadanki, India.

4) Actively participated in the 96<sup>th</sup> **Science Academies’ Refresher Course in Experimental Physics, February 6-21, 2018**, Sidho-Kanho-Birsha University, Purulia, WB.

3) Participated in the Seminar on “Materials for Biomedical Engineering”, 29<sup>th</sup> April, 2017, Department of Basic Science, Gargi Memorial Institute of Technology, Baruipur, Kolkata 700144.

2) Participated in the seminar **Natural Disaster Phenomena: Contemporary Developments**, Department of Atmospheric Sciences, Calcutta University, February 26, 2016.

1) First Kolkata Workshop on Role of Small Telescopes in Modern Astronomy Research, November 7–8, 2011 at S. N. Bose National Centre for Basic Sciences, Kolkata.

#### FDP/RC/FIP

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- 1) Four weeks Faculty Induction/Orientation Programme, November 10- December 09, 2020, Teaching Learning Centre, Ramanujan College, University of Delhi.
- 2) Two weeks online FDP on Python Programming, IIITDM Jabalpur, 7-18 Sep, 2020.
- 3) Two weeks interdisciplinary Refresher Course for “Advanced research methodology tools and techniques”, Jan 30- Feb 14, 2021, Ramanujan College, University of Delhi.