

**Organised by:**  
**Department of Physics**  
**The University of Burdwan**  
Burdwan 713 104  
West Bengal

**Date: 9 – 20 January 2023**

**Application Last Date:**  
2 January, 2023

**Application Link:**  
<https://atalacademy.aicte-india.org/login>

**Week 1: ONLINE**

**Google Meet**

Link will be shared with selected candidates only

**Week 2: PHYSICAL MODE**

**Location: Burdwan Univ**

**Local Organising Committee**

**Patron**

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**Coordinator:**

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**Co-Coordinator:**

**Dr J Chakravorty**

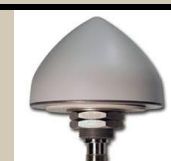


## 2-week Advanced Faculty Development Program (FDP)

Sponsored by

AICTE Training and Learning (ATAL) Academy

### Applications of GNSS/ NavIC in cost-efficient Solution Development



Global Navigation satellite system (GNSS) has become popular for myriads of applications due to the advantages of reliability, precision, availability and cost-effectiveness. Using satellite signals, GNSS provides accurate position, timing and velocity (PVT) information. As a result, multiple global (GPS from USA, GLONASS from Russia, Galileo from the European Union and Beidou from China) and regional (QZSS from Japan and IRNSS/ NavIC from India) systems are now operational. As per the GNSS Market Report (2019), the expected total GNSS business volume would be 2,525 billion Euros with applications sectors of consumer electronics, rail, road, aviation, maritime, surveying, logistics, agriculture, geomatics, timing and academic research. To maximize the use of multi-GNSS and to exploit the potential of NavIC, solution development relevant to the country is needed, the aspects of cost-efficient solution development would be discussed in this FDP

**The broad topics covered (not limited to) will be:**

- Basics of GNSS and NavIC
- GNSS error sources and Positioning Methods
- GNSS/ NavIC Positioning Applications (Agriculture, Resource Management, Intelligent Transport System (ITS), IoT, GIS/ Mapping)
- GNSS/ NavIC for Atmospheric research
- GNSS/ NavIC for Time Transfer
- GNSS Business Potential, Patent and Software Copyright
- GNSS data processing hands on.

**Organizing Institution and Department:**

The FDP is being organized by GNSS Laboratory, Burdwan (GLB) (<http://bugnss.in>), in the Department of Physics, The University of Burdwan. The laboratory has been developed with financial support from SAC-ISRO, DRDO, AICTE, ITR-DRDO, SERB-DST and is engaged in theory and application of GNSS and NavIC.

**Tentative Speakers:**

Sh Atul P Sukla, Former SAC-ISRO

Dr Sweta Shah, SVNIT, Surat

Dr P Banerjee, Former NPL, New Delhi

Dr Sourabh Das, IIT, Indore

Dr Alexei Zinoviev, NTLab, Lithuania

Dr Dinesh Manandhar, Tokyo Univ, Japan

**Speakers/ Representatives from Global and National Industry**

- Faculty members of the AICTE approved institutions, Research Scholars, PG Scholars, participants from Government, Industry can apply
- No registration fees. Hybrid Mode (week 1: Online, Week 2: Physical, Participants would be provided refreshment and Lunch, NO TA/ DA)
- Maximum Participants: 35 from Institution/ Organization within 100 km from Burdwan, for more details [Click Here](#)
- To apply, go to: <https://atalacademy.aicte-india.org/login>, create your credentials/ login, select "Workshops", select "West Bengal" under state, select the course and click on the + sign for the "Applications of GNSS/ NavIC in cost-efficient Solution Development" Course
- Certificate to the participants would be provided by ATAL Academy subject to fulfilment of stipulated criterions (marks and attendance).



# Tentative Program Schedule

(09 - 20 January 2023)

Application Link: <https://atalacademy.aicte-india.org/signup>



## WEEK I (ONLINE- On Google Meet)

Time	Day 1 (09/01/2023)	Day 2 (10/01/2023)	Day 3 (11/01/2023)	Day 4 (12/01/2023)	Day 5 (13/01/2023)	Day 6 (14/01/2023)
07:00 - 07:50 pm	Session 1 (Part I) Introduction to GNSS/ NavIC	Session 2 (Part I) GNSS Error Sources and Positioning Techniques	Session 3 (Part I) GNSS Compact Modules	Session 4 (Part I) GNSS/ NavIC Applications	Session 5 (Part I) GNSS/ NavIC in Atmospheric Research	Session 6 (Part I) GNSS based Time Transfer
BREAK						
08:00 - 08:50 pm	Session 1 (Part II) Introduction to GNSS/ NavIC	Session 2 (Part II) GNSS Error Sources and Positioning Techniques	Session 3 (Part II) GNSS Compact Modules	Session 4 (Part II) GNSS/ NavIC Applications	Session 5 (Part II) GNSS/ NavIC in Atmospheric Research	Session 6 (Part II) GNSS based Time Transfer
BREAK						
09:00- 09:30 pm	Discussions on Session 1	Discussions on Session 2	Discussions on Session 3	Discussions on Session 4	Discussions on Session 5	Discussions on Session 6

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<b>WEEK II (PHYSICAL MODE)</b>					
	<b>Day 1 (16/01/2023)</b>	<b>Day 2 (17/01/2023)</b>	<b>Day 3 (18/01/2023)</b>	<b>Day 4 (19/01/2023)</b>	<b>Day 5 (20/01)</b>
09:30-10:00	Inauguration				
10:00-12:30	Session 7 <b>GNSS in Agriculture</b>	Session 9 <b>GNSS in GIS/ Mapping</b>	Session 11 <b>GNSS/ NavIC Industry</b>	Session 13 <b>GNSS data processing Hands on #1</b>	Project Charter
12:30-1:30	<b>Article 1 Discussion</b> “Multi-GNSS precise point positioning for precision agriculture”, Guo, J., Li, X., Li, Z., Hu, L., Yang, G., Zhao, C., Fairbairn, D., Watson, D. and Ge, M., 2018, <i>Precision Agriculture</i> , 19(5), 895-911	<b>Article 2 Discussion</b> “Integrity monitoring for positioning of intelligent transport systems using integrated RTK-GNSS, IMU and vehicle odometer”, El-Mowafy, A. and Kubo, N., 2018, <i>IET Intelligent Transport Systems</i> , 12(8), 901-908	<b>Article 3 Discussion</b> “GIS applications in forest operations and road network planning: An overview over the last two decades”, Grigolato, S., Mologni, O. and Cavalli, R., 2017, <i>Journal for Theory and Application of Forestry Engineering</i> , 38(2), 175-186	<b>Article 4 Discussion</b> “On use of low cost, compact GNSS receiver modules for ionosphere monitoring Dan, S., Santra, A., Mahato, S., Koley, C., Banerjee, P. and Bose, A”. 2021, <i>Radio Science</i> , 56(12), 1-11	MCQ
1:30-2:30	<b>LUNCH (would be provided by the Organizers)</b>				
2:30-5:00	Session 8 <b>GNSS and IoT/ ITS/ Robotics</b>	Session 10 <b>GNSS in Mobile Phones</b>	Session 12 <b>GNSS Science Applications</b>	Session 14 <b>GNSS data processing Hands on #2</b>	(2:30-3:30) Reflection Journal
					(3:30-4:30) Feedback
					(4:30-5:30) Valedictory

### Contact

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