Monitoring the Arctic Ionosphere – Research and Applications

Abstract: As an Arctic nation, Canada confronts many challenges, which include resolving and addressing the effects of climate change as well as the effects of explosive release of energy from the Sun on our modern technology. It is well documented that processes in the Sun-Earth system, such as solar flares and storms, affect satellite and radio communication and navigation systems, aviation safety, electrical power grids, and even our climate. As our society increasingly depends on space technologies, and as our environment affects our daily life, Solar-Terrestrial interactions have become increasingly relevant to our day-to-day life. Understanding these interactions will enable us to predict and forecast space weather and subsequently mitigate detrimental effects on communication and navigation technologies and other critical infrastructure. Canada’s Arctic is a natural laboratory for the research of Solar-Terrestrial interaction and continuous monitoring of the Arctic atmosphere is crucial for the understanding of the Physics of Solar-Terrestrial interaction. To continuously monitor the Arctic ionosphere, we operate several radio instruments in the Arctic. This talk will outline the research and applications based on the monitoring of the Arctic ionosphere.

Short Bio: P. T. Jayachandran is a Professor of physics at the University of New Brunswick, Fredericton, NB, Canada. His research focuses on the Physics of Solar-Terrestrial interaction and the development of radio remote sensing techniques. He is the principal investigator of the Canadian High Arctic Ionospheric Network (CHAIN), a ground-based network of Global Navigation Satellite System (GNSS) Receivers and High-Frequency (HF Radars). He has published more than 140 peer-reviewed papers in various scientific journals and is a part of various national and international satellite missions. He is a member of the Canadian Committee of Antarctic Research (CCAR) and the data working group of the International Union of Radio Science (URSI). He is also a member of various national and international scientific bodies. He has supervised more than 20 graduate students and many of them won prestigious international young scientists awards for their research work.