



Career Journey and Current Challenges in Ionospheric Research

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Manuel Cervera received the B.Sc. (Hons.) and Ph.D. degrees from the Physics Department, The University of Adelaide, Adelaide, SA, Australia, in 1990 and 1996, respectively. His Ph.D. work, which was supported by the then Defence Science and Technology Organisation (DSTO, now DST Group), involved the observation and study of meteors in the upper atmosphere with a narrow beam VHF (55MHz) radar located at Buckland Park, South Australia. A key outcome of this work was the novel use of phase information that could be obtained from the meteor echoes with new (at the time) digital radar data acquisition techniques to determine the speed of the ablating meteoroids (the pre- t_0 phase technique). Subsequent to completing his Ph.D. Manuel transferred to full-time work at DSTO in the then High Frequency Radar Division as a Research Scientist. His research involved investigation into spread-F and spread Doppler clutter observed by HF radar and the scintillation of trans-ionospheric GPS radio signals due to equatorial ionospheric irregularities generated by the Rayleigh-Taylor instability. The latter involved the establishment of a network of GPS receivers for the measurement of ionospheric total electron content (TEC) and GPS based scintillation monitors in the South-East Asian region. He is currently a Senior Scientist and the Discipline Leader of the Radar Performance and Environment team in the HF Systems Science and Technology Capability area of DST Group. He is the author of the PHaRLAP toolbox for HF radio wave propagation studies which has been used by many organisations in academia, government and industry. His research interests include ionospheric physics, radio wave propagation through the ionosphere, HF radio systems, and performance modeling of over-the-horizon radar. Since 2018, he has been an Adjunct Associate Professor with the Space and Atmospheric Physics Group, School of Physics, Chemistry and Earth Science, The University of Adelaide. In that time he has supervised several students at the Honours and Masters Level as well as developing and delivering the Space and Atmospheric Physics lecture course at the Honours level. Manuel will discuss his career; the highlights, challenges and lessons learned; and discuss some of the current challenges for new researchers in ionospheric physics.