Using Hyperspectral IR Sounder Data Over Land - PC radiative transfer and 1d-Var.

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The Met Office started assimilating IASI data from the Metop platform in November 2007 and trials have shown it to have a big impact on NWP skill. However, current assimilation techniques only allow 183 of the 8461 available channels on IASI to be utilised and these are only assimilated in cloud free conditions. Over land the number of channels is reduced further to around 40 that have their peak sensitivity at altitudes above 400hPa. A novel new principal component radiative transfer scheme has been developed and coupled with a version of the UM 1d-Var code. Using this new technique we demonstrate the ability to use hyperspectral sounder data over all cloud free scenes including those over land. In this presentation results using around 4000 channels from the Airborne Research Interferometer Evaluation System (ARIES) on the FAAM BAe146 research aircraft will be presented showing the skill in retrieving temperature, water vapour and ozone profiles simultaneously with spectrally resolved land surface emissivity and land surface temperature all of which are required to utilise satellite data over land within an NWP environment. The presentation will conclude with a presentation on the future direction of this research which includes the simulation of cloud affected radiances using principal component radiative transfer.

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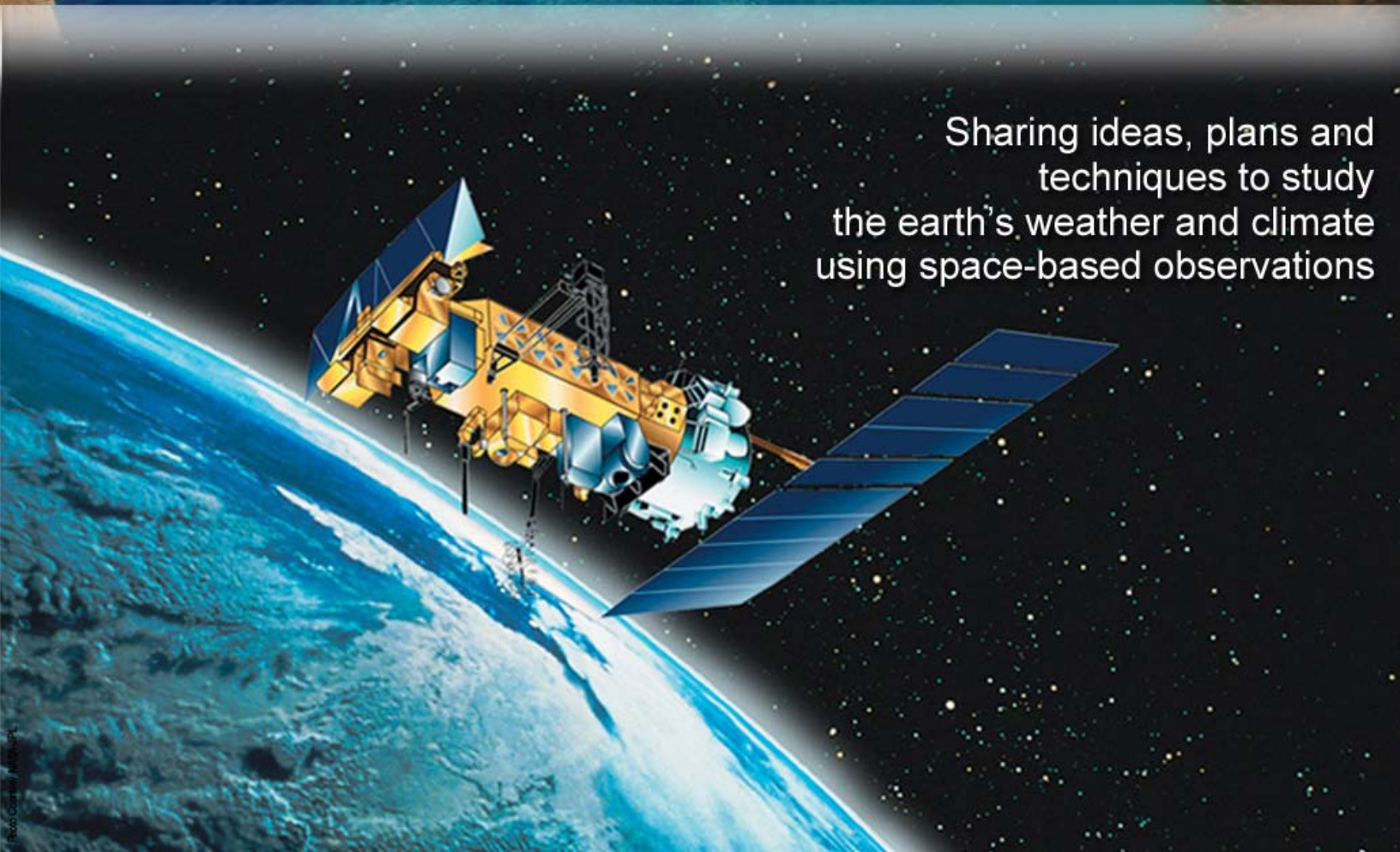

Sharing ideas, plans and techniques to study the earth's weather and climate using space-based observations