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## Chairman's Introduction

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## Chairman's introduction

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This meeting is about ways in which to use imagery, mainly but not entirely satellite imagery. What spurred Dr B. J. Conway, Dr J.-P. Muller, Dr D. Stanley and me into organizing the meeting is a concern about the lag between initial availability of satellite data and the eventual full exploitation of the data. As a meteorologist I am rather proud of the way in which we are reaping benefits from space techniques. Yet I am acutely aware that the first cloud pictures from a weather satellite were available more than a quarter of a century ago, whereas it is only quite recently that we have begun to develop procedures for using the imagery quantitatively and to adjust our operational practices to capitalize on it. This kind of delay is not unique to meteorology. The question is, why in general there should be such a delay?

The first reason for the delay in exploiting imagery is the disparity between the sums of money spent on launching satellites and building the instruments and the comparatively small sums of money available for ground facilities and the development of ways in which to use the data.

The second reason for the delay in exploitation is that digital imagery is difficult to handle. For a start, the amounts of data are prodigious. As that pioneer of satellite techniques, Verner Suomi, has so vividly described it, handling the flow of data associated with satellite imagery is like trying to drink from a fire hydrant. A necessary development has of course been the advances in computer hardware but that is not the whole story; the problem is that there is often a complex relation between the wanted information and what the satellite actually senses or resolves. There is a need to interpret the imagery in the light of a number of different strands of evidence. This evidence is in the form of *in situ* measurements, so-called 'ground truth' (but not always very true or representative), and also prior knowledge or understanding of aspects of the scene. These strands of evidence tend to be fragmentary and equivocal. Human judgement is needed to weigh the evidence.

It is obviously important to have a good man-machine interface if the human operator is to exercise his judgement effectively within the context of an otherwise highly automated image-handling system. In this meeting you will hear about the development of interactive computer display systems which act as fast, willing slaves, freeing their human masters for higher-level interpretive and decision-making tasks. You will also be hearing about attempts to learn how the human experts arrive at their judgements, and to find out what scope there is for developing systems with the intelligence to perform autonomously some of the higher functions that the human operator presently performs.

The third reason for the delay in exploiting imagery is the communications gulf between the image-processing specialists on the one hand and the potential users on the other. This meeting is an attempt to bridge that gulf. We have brought together people with hands-on experience in the use of imagery in various fields: in meteorology, in oceanography, and in the measurement of land use and man-made structures. My hope is that by sharing experiences in

the use of imagery in different fields we might see how techniques developed for one application may be used in another. As our last speaker will demonstrate, we do not have to depend solely on experience in remote sensing to gain insight into ways of interpreting remotely sensed imagery.

The way this discussion meeting has been structured is that the first day's papers deal mainly with the present situation. We shall hear about some of the currently available imagery, with concrete examples of how remotely sensed images are already being exploited. Then on the second day we shall hear about some of the image processing research that holds promise for the future; some first steps upon a long road.