



# Poland joins as third Cooperating State

EUMETSAT increased its membership again when Poland joined as the third Cooperating State following an official signing ceremony in Warsaw on 15 December 1999.

The Agreement, signed by Mr. Antoni Tokarczuk, Minister of the Environment, and Dr. Tillmann Mohr, Director of EUMETSAT, became effective on 1 January 2000.

Each of the Cooperating States make use of data received from Meteosat and from other satellites for their operational forecasting and research programmes. Poland's new status as a EUMETSAT Cooperating State will enable it to gain access to training in satellite meteorology and it will also benefit from interaction in the development of satellite data applications.

*Dr. Tillmann Mohr, Director of EUMETSAT, and Mr. A. Tokarczuk, Poland's Minister of the Environment, exchanging signed Agreements*

During the signing ceremony, Minister Tokarczuk said: "Poland's accession to EUMETSAT as a Cooperating State represents an important milestone towards the growth of the Polish Hydrological and Meteorological Service, particularly in the context of an upgrading project through a loan from the World Bank."



## Looking to the future

EUMETSAT is actively discussing the continuation of geostationary satellite services beyond the three planned Meteosat Second Generation satellites. There is agreement that a fourth satellite will be needed and current studies are looking at the possibility of carrying a geostationary sounder in the future.

High level discussions on polar satellites have also taken place between EUMETSAT and the US National Oceanic and Atmospheric Administration (NOAA).

Issues considered at a meeting in January included cooperation beyond the planned lifetime of the EUMETSAT Polar System, future satellite strategies and attendance as observers at each other's governing meetings.

The two organisations agreed to look at exchange of expertise in real-time data delivery from instruments using Global Positioning System signals

for sounding, and sharing of information on climate requirements.

Also at the beginning of the year, a World Meteorological Organization (WMO) Executive Council meeting with high-ranking representatives of meteorological and environmental monitoring satellite organisations discussed mechanisms for policy level interaction.

This resulted in setting up future consultative meetings on top-level policy matters between the WMO and the operators of environmental satellites, with the WMO representing the user community.

These initiatives go hand-in-hand with the development of the Integrated Global Observing Strategy, showing that there is a strong movement towards greater cooperation and synergy in many aspects of Earth Observation.

*index* *page*

**Preparation for the use of MSG in Africa** 2

PUMA Task Team update

**ISO certification for EUMETSAT** 2

Award recognises quality of service

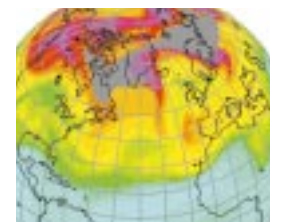


**Training for the next generation** 3

Development of the EUMETSAT training scheme

**Long-term ozone monitoring from Metop-GOME-2** 4

Contract for new GOME instruments assures future monitoring



**Extensive research potential from Meteosat-6 rapid-scan imagery** 4/5

Archive provides wide ranging opportunities

**Profile: Dr. Lorenzo Sarlo** 7

SAF Network Manager

**Microwave Humidity Sounders go to the USA** 8

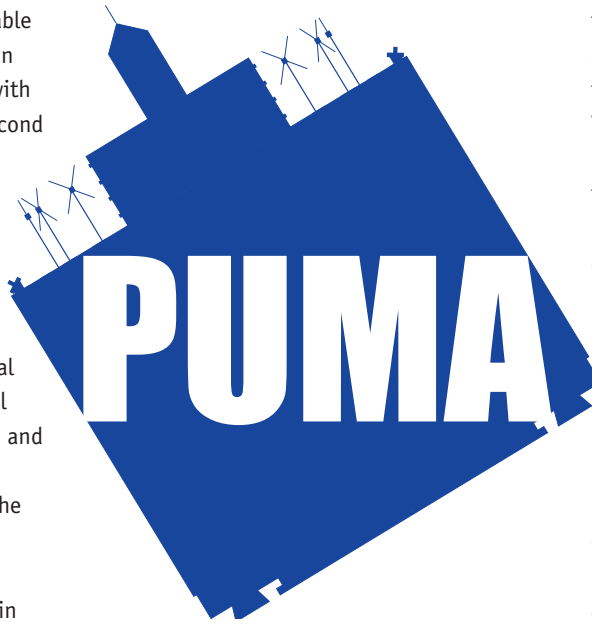
First exchange of Initial Joint Polar System

# Preparation for the Use of **MSG** in Africa (**PUMA**)

The PUMA Task Team has made considerable progress during the past six months on an initiative to equip all African countries with new workstations to receive Meteosat Second Generation (MSG) digital data.

The Natural Resources Institute (NRI) of the UK, under contract to the Directorate General for Development and the Directorate General Common Service of the European Commission (EC), is currently carrying out an appraisal of the project and will prepare a financial proposal to include the African countries and the Indian Ocean Islands.

A final decision on funding based on the NRI report is expected from the EC by September 2000 at the latest. Steps to secure funding for the African countries in



the Mediterranean basin, which are not covered by the above scheme, have been taken by Evans A. Mukolwe, Chairman of the Task Team, through bilateral contacts.

An International Invitation to Tender for the supply of equipment and training will be released around the time of the EC final decision. In addition, the EC has included provision for wider development, aimed at fostering the use of MSG data in Africa.

A presentation on PUMA will be made at the EUMETSAT User Conference in Bologna at the end of May. The Fourth EUMETSAT User Forum in Africa, in Kampala, Uganda, on 25-29 September 2000, will also offer an excellent opportunity to review the project's latest developments and to announce the final decision.

## EUMETSAT awarded ISO 9001 certification

*EUMETSAT Director Dr. Tillmann Mohr receives the ISO 9001 Quality Assurance Certificate from Prof. Dr. H.D. Seghezzi of SQS. Also pictured are Mr P.A. Rittiner (SQS) and Mr. G. Bernède, Head of Quality Assurance (EUMETSAT)*



EUMETSAT was officially awarded ISO 9001 certification from the Swiss Association for Quality and Management Systems at EUMETSAT Headquarters in Darmstadt, Germany, on 19 April 2000.

Since 1996 EUMETSAT has been engaged in a Quality Assurance Initiative for its overall activities - from Operations to Programme Management - and it has implemented a complete management system to ensure the

achievement of its objectives and continuous improvement in services.

The ISO 9001 registration is an important benchmark in measuring EUMETSAT's performance against internationally recognised standards. It is intended to confirm to our user community that EUMETSAT provides an efficient, cost-effective and valuable service.

### image

Printed in Europe. Published twice a year.  
Copying permitted if reference to source is given.

#### Editor

Michael Phillips (EUMETSAT)

#### Editorial support

Maria-Cristina Stricker (EUMETSAT)

#### Editorial, artwork and print

Janis Hunt (SIMCOMM)

Correspondence on IMAGE should be sent to:  
EUMETSAT User Service, Am Kavalleriesand 31,  
D-64295 Darmstadt, Germany.

Tel: +49(0)6151-807369 (helpdesk) or 807366

Fax: +49(0)6151-807304

E-mail: [ops@eumetsat.de](mailto:ops@eumetsat.de)

Web: [www.eumetsat.de](http://www.eumetsat.de)

# Training for the next generation

More than 190 classroom days have been spent on EUMETSAT-organised courses since its training activities in satellite meteorology began in 1994.

Many additional days were spent in the preparation and administration of these courses, most of which were held at locations far from the EUMETSAT Headquarters.

Initiated in Member States, the training scheme was quickly extended to developing countries, principally the World Meteorological Organization's African Regional Meteorological Training Centres in Nairobi, Kenya, and Niamey, Niger, and more recently, in Central and East European countries.

Classroom lectures have been supported by a wide range of Computer Aided Learning modules that students can use in their own time. Satellite Application Facilities have also played a part in training, the most recent event being a workshop in France on Ocean and Sea Ice in November 1999.

With Meteosat Second Generation (MSG) and the EUMETSAT Polar System (EPS) fast approaching, courses are now focusing more on the transition from current Meteosat

techniques to the new programmes, and in particular on data applications. The first European MSG-EPS course was hosted by the Deutscher Wetterdienst in Langen, Germany, in October, with representatives from the Meteorological Services of Denmark, The Netherlands, Switzerland, Hungary, Slovakia and Luxembourg.

Météo-France presented a course for African trainers and meteorologists, emphasising MSG data applications, at the Ecole Africaine de la Météorologie et de l'Aviation Civile, Niamey, in November. A similar course was held again in Niamey in February this year, presented by local trainers who had spent several weeks of intensive preparation in the EUMETSAT Headquarters.

MSG training will really take-off in Europe during the next 12 months with MSG-EPS courses planned for Brussels, Vienna, Toulouse, Budapest and Lisbon. Other training events will include a seminar on satellite meteorology in Langen, with participation from Central and Eastern Europe and a Climate SAF training workshop in Dresden, Germany.

*Photo: H. Verschuur*



## Director's Desk

It is always surprising and very satisfying to observe the number of important events that have taken place between each edition of *IMAGE* and the past eight months are no exception.

All seven Satellite Application Facilities are now in their development phase with two going through their mid-term reviews and another due later this year. These essential elements of the distributed EUMETSAT ground system will bring significant benefits to the user community in the coming years.

The EUMETSAT Polar System is now making very good progress. A contract has been awarded for the construction of three Metop satellites and associated instruments. Ozone measurements are well assured by a contract placed with Italian industry for three global ozone monitoring instruments (GOME-2), and the first two Microwave Humidity Sounders have been transported to the USA for integration on NOAA satellites.

The Meteosat Second Generation Programme is further on in terms of readiness. The launch of the first satellite is currently planned for July 2001. The delay from October this year is due to a number of factors including questions on the launcher and the readiness of the Ground Segment. A launch in July is better for conservation of manoeuvring fuel and supports our aim of providing a secure system that will serve the user community for many years to come.

Two high points marked the end of 1999. Poland joined as EUMETSAT's third Cooperating State, following the Slovak Republic and Hungary. Then, finally, after four years of hard work on Quality Assurance, we came through a successful audit by the Swiss Association for Quality and Management Systems. The resulting ISO 9001 certificate, signifying the quality of our services, was officially awarded on 19 April this year.



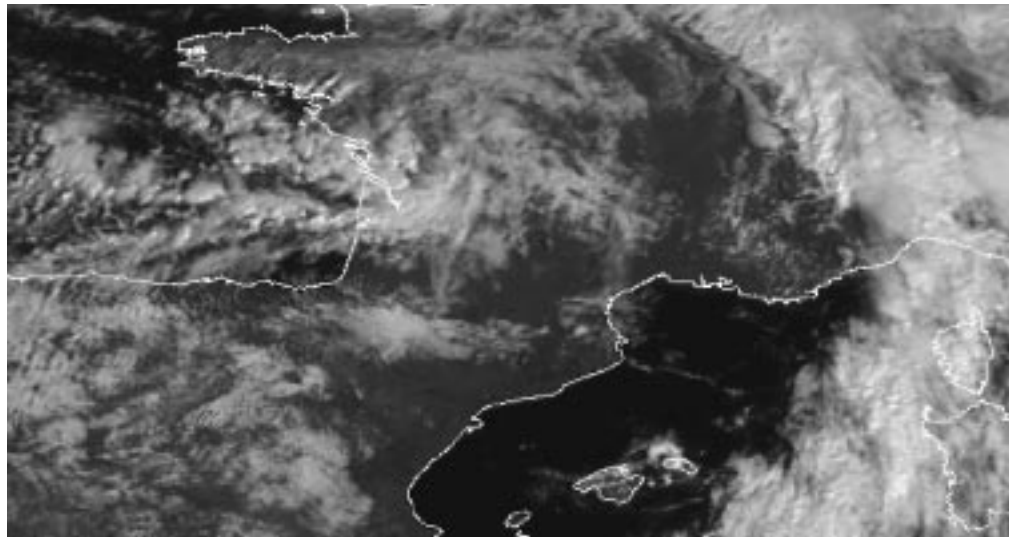
# Extensive research potential from

By **HansPeter Roesli**  
MeteoSvizzera

An archive of Meteosat-6 five-minute imagery was created between September and November 1999 during the Special Operations Phase of the Mesoscale Alpine Programme (MAP).

Within 18 imaging sequences related to specific synoptic situations over and around the Alpine region, a total duration of 410 hours of Meteosat-6 data in three spectral channels was collected.

These rapid-scan data sets are now stored in the MAP Data Centre at the Swiss Federal Institute of Technology in Zurich. Further information is available from the e-mail address: [ap@atmos.umnw.ethz.ch](mailto:ap@atmos.umnw.ethz.ch).

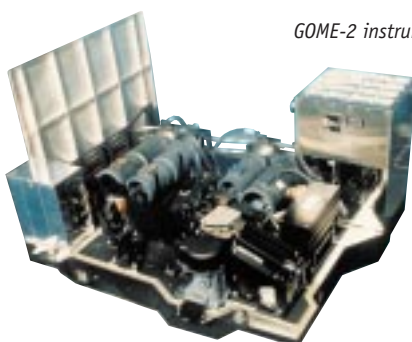


One Meteosat-6 five-minute scan taken at 08.34 UTC on 20 September 1999, showing the development of convective thunderstorms over northern Italy at noon. The stationary cloud edge on the north face of the Alps formed by the Föhn effect from Meteosat-6, graphically illustrating these phenomena, may be viewed on the EUMETSAT website at [www.eumetsat.org](http://www.eumetsat.org)

# Long-term ozone monitoring from **Metop-GOME-2**

A contract for three new Global Ozone Monitoring Experiment-2 (GOME-2) instruments, signed in Florence, Italy, on 3 March 2000, has assured continued monitoring of ozone well towards the end of the next decade.

The contract on the procurement of the instruments was awarded to Alenia Difesa/Officine Galileo BU Spazio in Italy. GOME-2 will be flown in the three Metop spacecraft, starting on Metop-1, scheduled for launch in 2003. The construction of the first flight model is funded by EUMETSAT and



GOME-2 instrument

Photo courtesy of Officine Galileo BU Spazio

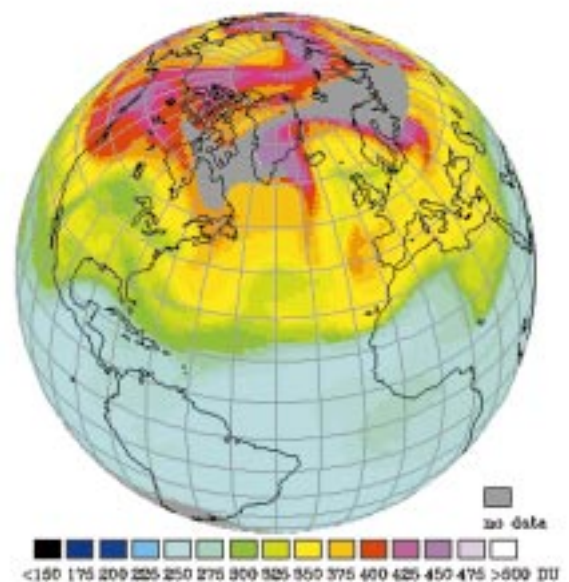
ESA, with EUMETSAT alone funding the second and the third flight models for Metop-2 and 3. The first flight model delivery is scheduled for April 2001.

Measurements by GOME-2 will allow the daily global retrieval of total ozone and the vertical ozone profile in the atmosphere, in addition to the detection of other minor atmospheric constituents.

The variation of atmospheric ozone is of vital importance and its distribution needs to be mapped continuously. The enhanced GOME-2 instrument on Metop will continue the series of ESA measurements started with ERS-2.

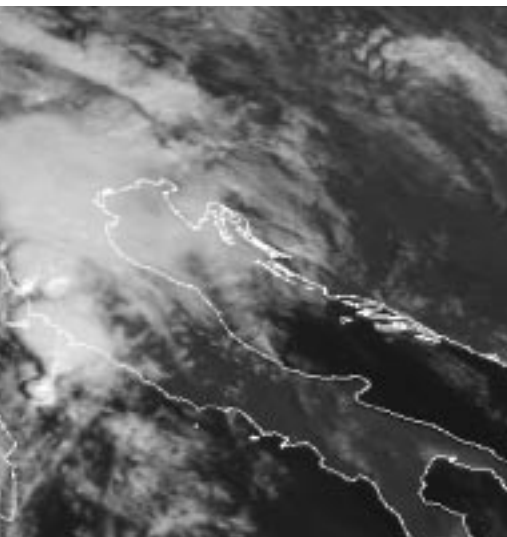
In addition to enhanced data for Numerical Weather Prediction, measurements from GOME-2 will continue and improve the climate record of ozone. Monthly and seasonal maps of ozone distribution throughout the atmosphere will provide a

record of its variation with time, helping to detect long-term trends of major importance for the health of the planet.



Assimilated GOME total ozone  
KNMI/ESA

# Meteosat-6 rapid-scan imagery



activity, north-east of Sardinia, leading to considerable  
effect is also visible. The full rapid-scan movie sequence  
[sat.de/en/area3/meteneews/map.html](http://sat.de/en/area3/meteneews/map.html)

Many research activities will make use of the rapid-scan collection:

- Calibration of Infrared and Water Vapour channels (no real-time calibration done)
- Explanation of particular wind profiler features in Föhn flow
- Improving stereo cloud top height determination
- Structure and movement of upper-level positive vorticity (rotation) cloud filaments as they approach the Alps
- Stationary nature of gravity waves
- Explicit handling of convection by MC2 mesoscale model
- Improvement and verification of conceptual models of heavy rain events
- Growing phase of convective systems
- Derivation of cloud vector winds in the Mistral over France
- Cloud movement connected with precipitation in northerly and southerly flow
- Issues of time resolution regarding current Meteosat and future Meteosat Second Generation operations
- Documentation of thunderstorm activity over northern Italy

There will be a special workshop on the use of rapid-scan data on 1 June 2000 at the EUMETSAT Users' Conference in Bologna.

## Satellite view of severe Christmas storm

Central Europe was struck by two powerful storms which caused severe damage in France, Germany, Switzerland and Italy just after Christmas 1999. This satellite image shows the first of the two storms, which rapidly crossed France and Germany.

From the early morning it moved swiftly across France damaging buildings and uprooting trees, particularly in the Paris area, passing near to Frankfurt by early afternoon on 26 December.

The occluded spiral can be clearly observed in the Meteosat-7 visible channel image. The intensity of the winds over Europe can be seen from the signs of the blocking of the clouds on the northern slopes of the French Jura and the Alps, as well as the orographic wave clouds on the lee side of Corsica and Sardinia.

The rather small size of the depression, as shown by the visible image, is also a typical sign of its rapid movement to the east.



Meteosat visible channel – 26 December 1999 at 12.00 UTC

# New version of the **ATOVS** and **AVHRR** Processing Package released

Distribution of the new version of the Advanced TIROS Operational Vertical Sounder (ATOVS) and the Advanced High Resolution Radiometer (AVHRR) Processing Package (AAPP) to the worldwide user community started in January 2000.

The AAPP performs the end-to-end processing of sounding and imager data from the High Resolution Picture Transmission (HRPT) direct readout data stream of the NOAA/TIROS-N satellites and also their successors from 1998 onwards.

The system was developed under the coordination of EUMETSAT with participation from Météo-France, The Met. Office (UK), the European Centre for Medium-Range Weather Forecasts (ECMWF), the Koninklijk Nederlands Meteorologisch Instituut (Netherlands), the

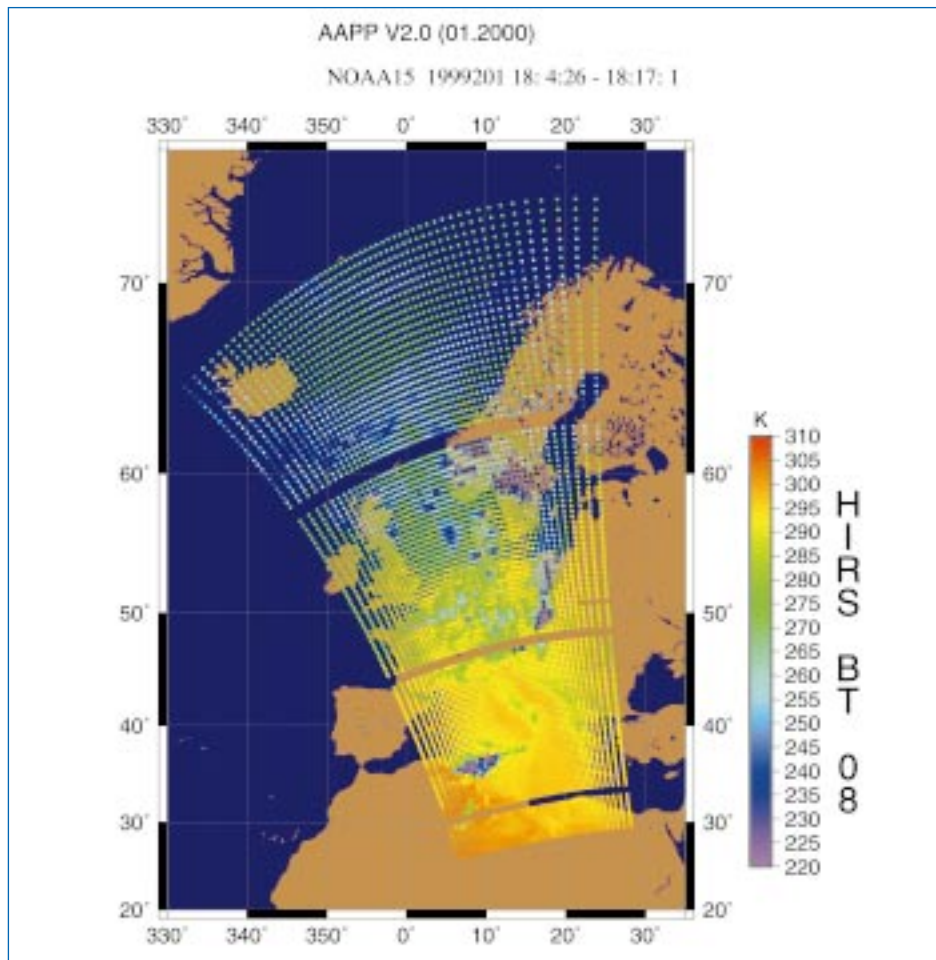
Laboratoire de Météorologie Dynamique du CNRS (France) and the Deutscher Wetterdienst (Germany).

The new version of the AAPP is a consolidation of updates and modifications to previous releases. It performs data ingest, navigation, calibration, preprocessing, mapping and cloud mask processing on data from AVHRR, TOVS and ATOVS instruments, in addition to interference correction for the Advanced Microwave Sounding Unit-B (AMSU-B).

Currently 120 users from 40 countries have obtained the AAPP.

More detailed information on the AAPP can be found at:

[www.eumetsat.de/en/area4/aapp](http://www.eumetsat.de/en/area4/aapp).



An HIRS temperature analysis showing an example of the AAPP output

## MSG launch

The October 2000 launch of MSG-1 has been delayed, with July 2001 as the most probable new date. The delay will enable the resolution of questions on the launcher and will ensure that critical Ground Segment elements are ready. The EUMETSAT website will give more precise details of the date when this is finalised.

## Seven Satellite Application Facilities underway

All seven planned Satellite Application Facility (SAF) projects are up and running with the approval in 1999 of the SAFs on Global Navigation Satellite System Receiver for Atmospheric Sounding (GRAS) Meteorology, and Land Surface Analysis.

The SAFs on Support to Nowcasting and Very Short Range Forecasting, and Ocean and Sea Ice, successfully performed demonstration experiments in the second half of 1999. The objective was to obtain feedback from users on the content and quality of the products and to test and demonstrate the processing chain and capabilities of the SAFs. Feedback was very positive and resulted in prolongation of the experiments with further tests in 2000.

A workshop at the end of November 1999, hosted by Météo-France on behalf of the SAF on Ocean and Sea Ice, was a unique opportunity to present the project's aims and achievements, and the SAF network concept. Scientific issues relevant to atmosphere and ocean applications of satellite data were addressed together with the SAF products and their development status.

This ongoing series of SAF workshops provides a forum for open discussion of SAF project results and for the involvement of users. The focus on scientific and development topics forms a sound basis for the evolution of the SAF network towards provision of operational services in the long term.

image

profile

## Dr. Lorenzo Sarlo

SAF Network Manager

Born in 1953 near Naples, Italy, he is an Aerospace Engineering graduate of the University of Naples and based his doctorate thesis on Computational Fluid Dynamics. He also studied Aeronomy and Aeronautical Meteorology.

His initial position with Olivetti, in Torino, was as a research engineer modelling fluid dynamics for the performance of ink-jet printers. Later he became leader of the Computational Linguistics Team, managing development of linguistic models supporting speech recognition. As a system engineer with the IBM Italy Software Development Laboratory he had design responsibilities for operations research software products.

Before joining EUMETSAT Dr. Sarlo worked for Alenia Spazio for over 13 years, where he was responsible for several projects as head of the Simulation and Software Architecture unit of the Turin plant. These included coordination of Alenia Spazio's work on the

on-board and ground software systems for the International Space Station, the ESA crew workstation test-bed project and four projects for the Commission of the European Communities focused on distributed engineering and simulation.

He has published a number of scientific articles and a book on 'Stability of Fluid Motion in Rotating Systems'. His many contributions to international symposia have covered fields such as software management and engineering, simulation and technology innovation. He is also a consultant of the European Commission Framework Research Programme and his leisure interests are archaeology and history.

Dr. Sarlo's scientific background and managerial skills are sure to be significant factors in the development of an effective SAF network.



Dr. Lorenzo Sarlo

Dr. Lorenzo Sarlo, appointed as EUMETSAT SAF Network Manager in December 1999, aims to contribute to the establishment of the SAF network in the interests of EUMETSAT's Member States and to build solid working relationships with the European SAF consortia teams.

# Integrated Global Observing Strategy moves ahead

The Integrated Global Observing Strategy (IGOS) Partnership has now reached a level of maturity which allows it to deal effectively with the complex series of tasks it faces.

A major step taken in 1999 was the decision that future requirements and observations should be assessed through themes, which could be promoted by any partner, but would usually involve several.

The first agreed theme, led by the US National Aeronautics and Space Administration (NASA), was on oceans. Another theme on the Global Carbon Cycle will have three elements: the Terrestrial Carbon Cycle, the Ocean Carbon Cycle and



an over-arching activity to link the terrestrial and ocean elements.

The IGOS Partnership met in Stockholm in November 1999, during the Committee on Earth Observation Satellites (CEOS) plenary meeting, which were both under the Chairmanship of EUMETSAT.

Two new ad hoc working groups were established for the year 2000: one on Disaster Management, intended to maintain the CEOS effort in this field, and the second on Earth Observation Education and Training in Developing Countries.

The World Meteorological Organization has taken over Chairmanship of the IGOS Partnership for 2000, and Chairmanship of CEOS has passed to the Brazilian Space Agency.



# Microwave Humidity Sounders go to the USA

The first flight hardware to be procured directly by EUMETSAT has been integrated into the US polar orbiting meteorological satellite NOAA-N in preparation for its launch which is scheduled for December 2003.

Two Microwave Humidity Sounders (MHS), designed to provide humidity profiles throughout the atmosphere, were transported to the USA in February.

Integration of the first unit took place on 8 March and the second has been placed in storage ready for the next satellite in the series.

The supply of the MHS units represents the first exchange of the Initial Joint Polar System (IJPS), through which EUMETSAT and the US National Oceanic and Atmospheric Administration (NOAA) will operate complementary polar orbiting satellites, each carrying some common shared instruments.

A third MHS instrument has completed its acceptance review and is assigned to EUMETSAT's first Metop satellite, scheduled for launch in 2003. A fourth unit is under test ready for delivery this year.

Data from the MHS will greatly improve the information needed for accurate computer-based weather forecasting.

## Conference Diary

EUMETSAT is organising or is involved with the following conferences in 2000:

17 – 19 May, Bologna, Italy: **MSG-RAO Workshop** organised in cooperation with ESA.

29 May – 2 June, Bologna, Italy: **the EUMETSAT Meteorological Satellite Data Users' Conference**.

25 – 29 September, Kampala, Uganda: **the Fourth EUMETSAT African User Forum**.

5 – 6 October, Darmstadt, Germany: **European Global Ocean Observing System Conference** (closed invitation).

Details of these events and other relevant meetings and workshops can be found on the EUMETSAT website.

## Global satellite update

**Europe:** *Meteosat-7 still supports EUMETSAT's primary service. Meteosat-6, as the back-up spacecraft positioned at 9°W, supported the Mesoscale Alpine Programme from September to November 1999. Meteosat-5 continues the service from 63°E, initially established for the INDOEX project and now extended until the end of 2001 as the Indian Ocean Data Coverage service.*

**USA:** *GOES-10 (West) is the operational satellite at 135°W. GOES-8 (East) continues to function at 75°W with no significant changes. The successful launch of GOES-L took place on 3 May 2000. NOAA-15, in polar orbit, has replaced NOAA-12, which is now used as a back-up satellite. NOAA-14 continues to function well. NOAA-L is scheduled for launch in August 2000 and NOAA-M in mid-2001.*

**Russia:** *The new generation of Russian polar orbiting meteorological satellites, Meteor-3M-1, is planned for launch into a morning sun-synchronous orbit this year. GOMS-2 and Meteor-3M-2 are scheduled for 2001 and 2002 respectively.*

**China:** *The FY-2A launched in June 1997 ceased operations on 3 March 2000 due to an on-board technical problem. China plans to launch its next FY-2 geostationary satellite in the near future. The FY-1C polar orbiting meteorological satellite was successfully launched on 10 May last year and the next in the series, FY-1D, is scheduled for 2001.*

**Japan:** *GMS-5, the current operational geostationary meteorological satellite, will continue until the next generation, MTSAT. The first MTSAT spacecraft was destroyed during its launch on 15 November 1999 through a failure of the launcher's main engine. GMS-4 was de-orbited on 24 February 2000. It provided a great number of images from 1989 onwards and was retained as a back-up satellite after the launch of GMS-5 in 1995.*

**India:** *INSAT-2B, INSAT-1D and INSAT-2E, the latter successfully launched on 3 April 1999, are the current operational satellites. INSAT-2A is in stand-by mode.*

