COST Action 724
Developing the Scientific Basis for Monitoring, Modelling and Predicting Space Weather

- Main objective
  - **to develop within a European framework the scientific basis of space weather applications, and to explore methods for providing a comprehensive range of services to a variety of users, based on modelling and monitoring of the Sun-Earth system.**
- Reminder
  - COST only funds coordination activities, not research

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- The general aims of the Action:
  - To coordinate research into improving modelling and prediction of space weather
  - To promote where necessary the deployment of new instrumentation to satisfy data requirements, and the development of new models
  - To educate potential users of space weather data
  - To gather feedback from users which may be used to improve services
  - To develop a forum for exchanging “best practice” among users and providers of space weather services
  - To set standards on data exchange

Proposal for COST Action on Space Weather

- Management Committee
  - Up to 2 members per Member State
- Four Working Groups
  - WG1 Monitoring and Predicting Solar Activity for Space Weather
  - WG2 The Radiation Environment of the Earth
  - WG3 Interaction of Solar Wind Disturbances with the Earth
  - WG4 Space Weather Observations and Services

Management Committee

- Responsibilities
  - Identify WGs and allocate general work packages
  - Monitor WG progress
  - Manage liaisons with external groups
  - Compile annual reports
  - Coordinate publications
  - Organise annual workshops

WG1 Monitoring and Predicting Solar Activity for Space Weather

- Aims of research
  - Use of images and observations to predict energetic particle enhancements
  - Use of images and observations to predict CMEs
  - Modelling and prediction of EUV for satellite drag applications
  - Liaise with COST 271 where relevant to radio propagation
  - Liaise with WG4 on products and services

WG2 The Radiation Environment of the Earth

- Aims of research
  - Model interaction of solar energetic particles with the magnetosphere
  - Model development of trapped radiation in the magnetosphere
  - Set up and maintain database of effects of radiation on technology and human health
  - Study how technology and human health is affected by various forms of radiation
  - Liaise with WG4 on products and services

WG3 Interaction of Solar Wind Disturbances with the Earth

- Aims of research
  - Model the propagation of CMEs to Earth
  - Model geomagnetic storm development using L1 monitor data (liaise with COST 271 where relevant)
  - Model geomagnetically induced currents which may affect ground-based technology
  - Set up and maintain database of geomagnetic effects on technology
  - Liaise with WG4 on products and services

WG4 Space Weather Observations and Services

- Aims of research
  - Coordinate network of European websites relevant to data, models, prediction, public outreach
  - Develop methods and standards for data exchange to enable coupling of different STP and applied models (eg Spacegrid?)
  - Liaise with COST 271
  - Maintain database of users and statistics about the service

	Year 1	Year 2	Year 3	Year 4
MC	Identify working groups; allocate specific work packages; Consolidate WG output into annual report	Monitor WG progress; Manage liaisons with external groups; Consolidate WG output into annual report; Organise annual workshop	Monitor WG progress; Manage liaisons with external groups; Consolidate WG output into annual report; Organise annual workshop	Monitor WG progress; Manage liaisons with external groups; Consolidate WG output into annual report; Organise annual workshop
WG 1	Create catalogue of existing sources of data and models; Review of scientific understanding	Recommend scheme for predicting SEP onset; Recommend scheme for predicting CME initiation; Recommend scheme for predicting solar EUV radiation variations	Implement scheme for predicting SEP onset; Implement scheme for predicting CME initiation; Implement scheme for predicting solar EUV radiation variations;	Evaluate scheme for predicting SEP onset; Evaluate scheme for predicting CME initiation; Evaluate scheme for predicting solar EUV radiation variations;
WG 2	Create catalogue of existing sources of data and models; Review of scientific understanding	Recommend scheme for modelling SEP effects, trapped radiation and galactic cosmic radiation at Earth; Create catalogue of reported events when humans, satellite and avionic technology affected	Implement scheme for modelling SEP effects, trapped radiation and galactic cosmic radiation at Earth;	Evaluate scheme for modelling SEP effects, trapped radiation and galactic cosmic radiation at Earth;
WG 3	Create catalogue of existing sources of data and models; Review of scientific understanding	Recommend scheme for modelling CME propagation to, and interaction with, Earth; Recommend scheme for modelling induced ground electric fields; Create catalogue of reported events when ground-based technology affected	Implement scheme for modelling CME propagation to, and interaction with, Earth; Implement scheme for modelling induced ground electric fields;	Evaluate scheme for modelling CME propagation to, and interaction with, Earth; Evaluate scheme for modelling induced ground electric fields;
WG 4	Create and manage website with links to data sources identified by WG1 - 3; Incorporate outreach material.	Identify where standards on data exchange need to be set, and propose solutions; Implement catalogues of reported events on website;	Manage web links to models implemented by WGs incorporating data exchange standards; Summarise usage statistics; Manage space weather events catalogue	Manage web links to models implemented by WGs incorporating data exchange standards; Summarise usage statistics; Manage space weather events catalogue

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History of Proposal

- Drafting of Technical Annex started October 2001 (SWWT Activity)
- Submitted to Meteorology TC March 2002
- Accepted by Meteorology TC June 2002
- Approved by CSO July 2002

Next Steps

- Lobbying for relevant COST Member States to sign up to MoU
- Coordinate planning with applications for funding under FP6
- Coordinate planning with ESA SW Pilot Project
- Organise MC meeting for April 2003

Web site currently at:
http://www.geomag.bgs.ac.uk/COST

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Potential Participants

• Austria:	IGAM
• Belgium:	BIRA, KU Leuven
• Czech Republic:	Geophysical Institute
• Denmark:	DMI
• European Space Agency:	ESTEC, ESOC
• Finland:	FMI
• France:	CNES, LPG and Meudon
• Germany:	DLR, University of Greifswald
• Greece:	National Observatory of Athens
• Hungary:	GGRI
• Ireland:	DIAS
• Italy:	National Institute for Astrophysics
• Poland:	RWC Warsaw
• Spain:	University of Barcelona
• Switzerland:	University of Bern
• Sweden:	IRFL
• Turkey:	Istanbul Technical University
• UK:	MSSL, Qinetiq, RAL, Virgin Atlantic