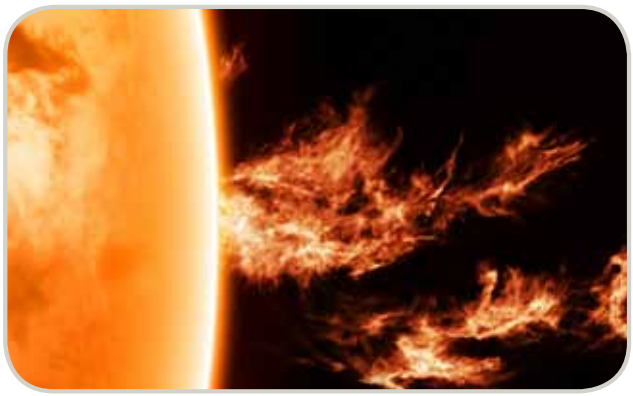
SWIFF

Space Weather Integrated Forecasting Framework

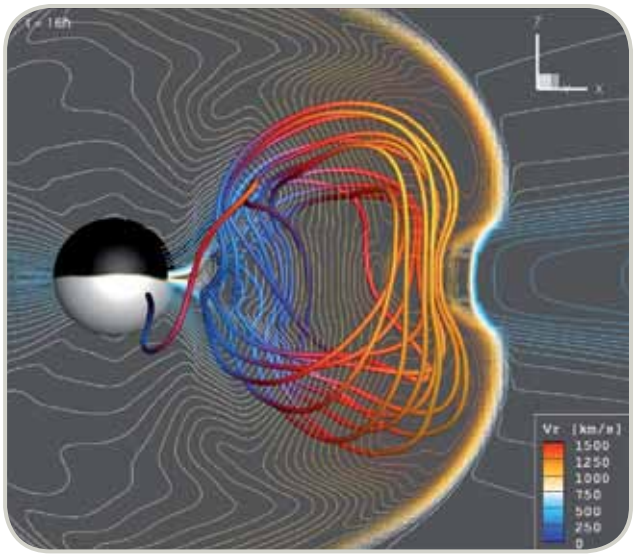
FORECASTING THE SUN

Space weather rarely makes it into the evening news, yet increasingly the Sun's activities are understood to impact life on Earth. The SWIFF project is set to establish a model for better space weather forecasting.



Solar activity © Ig0rZh - Fotolia.com

What happens between the Sun and Earth is space weather, and our knowledge about it lacks precision. Existing models for space weather forecasting do not create an adequate basis for sound and solid space weather forecasting. Whilst space weather is understood to impact the functioning of major communication systems, such as GPS and major electricity grids, the fundamental physics that drive this phenomenon still need to be further understood.



c3D MHD simulation following a CME from the lower solar corona up to the orbit of the Earth. © SWIFF

The project SWIFF takes on this challenge. It is determined to go back to basics – that is back to physics – and develop an integrated framework for the modelling of space weather. Thus starting from the fundamental physics, the projects will develop first mathematical models of space weather processes. Then in a second step, SWIFF will proceed to develop computational algorithms target to the models at hand, and finally implement a common integrated software infrastructure for enhanced space weather forecasting. The ultimate aim of the project is to form the equivalent of what is now commonplace in regular meteorological models, yet applied in the context of space weather.

GIOVANNI **LAPENTA**
IS PROJECT COORDINATOR

SWIFF will cover all aspects of the evolution of space weather from the Sun to the effects it has on Earth, and in doing so the project will be aided by experts from across Europe, who have extensive experience in supercomputing facilities, which is needed for space weather forecasting to be effective.

The project also engages in extensive outreach activities aimed at raising awareness about the importance of space weather, and has undertaken to organise a space weather modelling school two years after its start in order to disseminate project findings.

SWIFF will develop a physics-based simulation basis for space weather forecasting.

QUESTIONS & ANSWERS

What do you want to achieve with this project?

SWIFF will develop mathematical models of the physics of space weather. Based on these models, SWIFF will produce computational methods and design software to form the basis for space weather forecasting in Europe.

Why is this project important for Europe?

Europe needs to be at the forefront in space technology. One aspect of this is the ability to simulate with accuracy the processes developing in space to predict the impact on the space assets and on the human activities in space.

How does your work benefit European citizens?

In our competitive global economy the Europeans need to lead rather than be led in two of the most important areas of modern technology: high performance computing and space industry. SWIFF pushes forward the state of the art on computer models of the space environment

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LIST OF PARTNERS

- Katholieke Universiteit Leuven, Belgium
- Belgian Institute for Space Aeronomy, Belgium
- Università di Pisa, Italy
- Københavns Universitet, Denmark
- Astronomical Observatory Turin - Istituto Nazionale di Astrofisica, Italy
- Astronomical Institute, Academy of Sciences of the Czech Republic, Czech Republic
- University of St Andrews, Scotland, UK

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PROJECT INFORMATION

Space Weather Integrated Forecasting Framework (SWIFF)
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SPACE WEATHER