

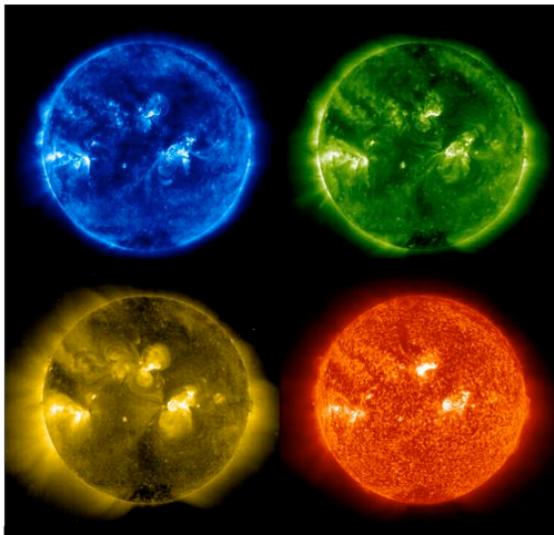
Solar-Terrestrial Center of Excellence

## Belgian solar physicists win prizes

### Scientific results thanks to a 12 years old space based telescope

*A young scientist, Elena Podladchikova, gets the internationally recognized Zeldovich medal pinned up during the COSPAR conference in Canada. The medal is conferred for excellence and achievements. Dr. Podlachikova works at the 'Solar-Terrestrial Center of Excellence' (STCE), a Sun-Earth research group in Ukkel, Brussels. Members of this team are also nominated for the prestigious Descartes prizes for their unique and excelling contributions to solar physics and space research.*

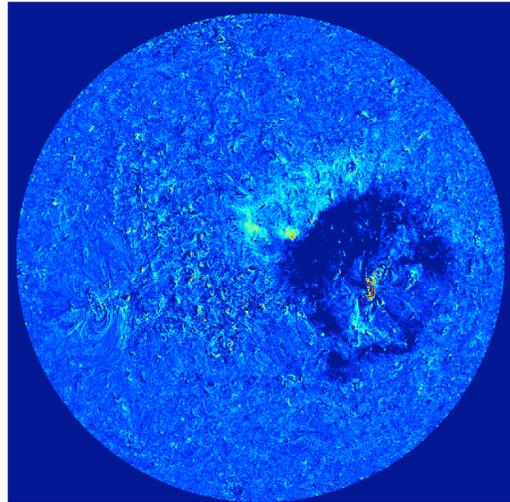
As for the movie entertainment industry, festivals and awards for different categories exist in the scientific community. The European Descartes Prize is awarded for achieving outstanding scientific or technological results through collaborative research in any field of science. A number of STCE scientists are member of a team nominated for this money prize. These solar physicists worked on a telescope onboard the ESA-NASA solar mission SOHO. This satellite was launched in 1995. The Extreme Ultraviolet Imaging Telescope, EIT in short, was built by the Centre Spatial de Liège and was a strong example of high technology development. EIT was the first of a generation of innovating space based observatories. Before EIT, scientists could only sporadically observe physical phenomena on the sun. It was a Belgian scientist's idea to introduce the concept of generating a full disk movie of the sun over a long time period. Thanks to EIT, Belgium got the scoop of observing for the first time sound waves in the solar atmosphere.



Four solar images taken by EIT, each in a different wavelength of the extreme ultraviolet spectrum. We see loops, black zones, bright spots. This could never be seen in the visible light. The sun doesn't seem to be a simple yellow ball, the solar disk is full of complex structures.

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Elena Podladchikova did pioneering research on solar tsunami's, waves on the solar surface. Solar tsunami's are an indication of gas clouds, violently catapulted away from the sun into space. These clouds are important for space weather. Space weather is the equivalent for the usual weather, but in space. Disturbed space weather can cause disturbed radio communication, interruptions in the electricity network, corrosion of pipelines, inaccurate GPS-measurements, malfunctioning or defect satellites. It can lead to dangerous situations during space missions, but has also consequences for airplane flights with routes over the North pole.



A processed EIT image of the sun with an example of a solar tsunami.

To conclude: EIT itself is a candidate for a real movie nomination in the category 'visual effects'. EIT-images were used in Hollywood productions like 'The Da Vinci Code', 'Spiderman 2' and 'Sunshine'.

## The scientists

Elena Podladchikova studied Space Physics at Kiev National University before starting her PhD research at the Laboratoire de Physique et Chimie d'Environnement of the Observatoire d'Orléans. She obtained her PhD from Orleans University in February 2002. After a 1-year postdoctoral stay at the Max-Planck Institute for Solar System Research in Lindau, she moved to the Royal Observatory of Belgium in 2003. She studies plasma turbulent processes in the heliosphere and has contributed significantly to projects linked to the analysis of solar images taken with the EIT telescope on SOHO, the preparation of the STEREO mission, but also to the preparation of Belgium's first Space Weather satellite: PROBA2, to be launched early 2009.



Within the Royal Observatory of Belgium, Elena Podladchikova is currently working as a senior researcher in the Solar-Terrestrial Centre of Excellence.



David Berghmans is a solar physicist who got his PhD at the KULeuven in 1997. He did research about the coronal heating by means of waves at the centre of plasma physics. In that same year, he started at the Royal Observatory of Belgium, ROB.

He was one of the driving forces for the participation of the ROB in the EIT-consortium. This initiated the founding of an internationally known Belgian space weather center. He created CACTus, a software to automatically detect plasma clouds in satellite images near the vicinity of the sun. He worked one year at ESTEC, the European Space Research and Technology Centre. ESTEC is the largest site and the technical heart of ESA, the European Space Agency.

David Berghmans is the science Principal Investigator' of the telescope ZWAP onboard of the European micro satellite. SWAP builds upon the heritage of EIT. Centre Spatial de Liège was responsible for the construction of the telescope, while the Belgian company Verhaert Space built the satellite.

## **The STCE**

The STCE is an ambitious project combining the strengths of the three research institutes of the Space Pole in Ukkel (ROB, RMI and BISA) together into Europe's largest Space Weather research and service center. The STCE website is under construction.

More info about the STCE as an organisation: <http://sidc.be/news/099/welcome.html>

More info about space weather and the prediction center: <http://sidc.be/>

## **List of abbreviations**

BISA	Belgian Institute for Space Aeronomy
CACTus	Computer Aided CME tracking
COSPAR	Committee on Space Research
ESA	European Space Agency
ESTEC	European Space Research and Technology Center
EIT	Extreme ultraviolet Imaging Telescope
GPS	Global Positioning System
NASA	National Aeronautics and Space Administration
NEMO	Novel EIT wave Machine Observing
PROBA	Project for On-Board Autonomy
RMI	Royal Meteorological Institute
ROB	Royal Observatory of Belgium
SIDC	Solar Influences Data analysis Center
SOHO	Solar and Heliospheric Observatory
STCE	Solar-Terrestrial Center of Excellence
SWAP	Sun Watcher with APS detectors and image Processing

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