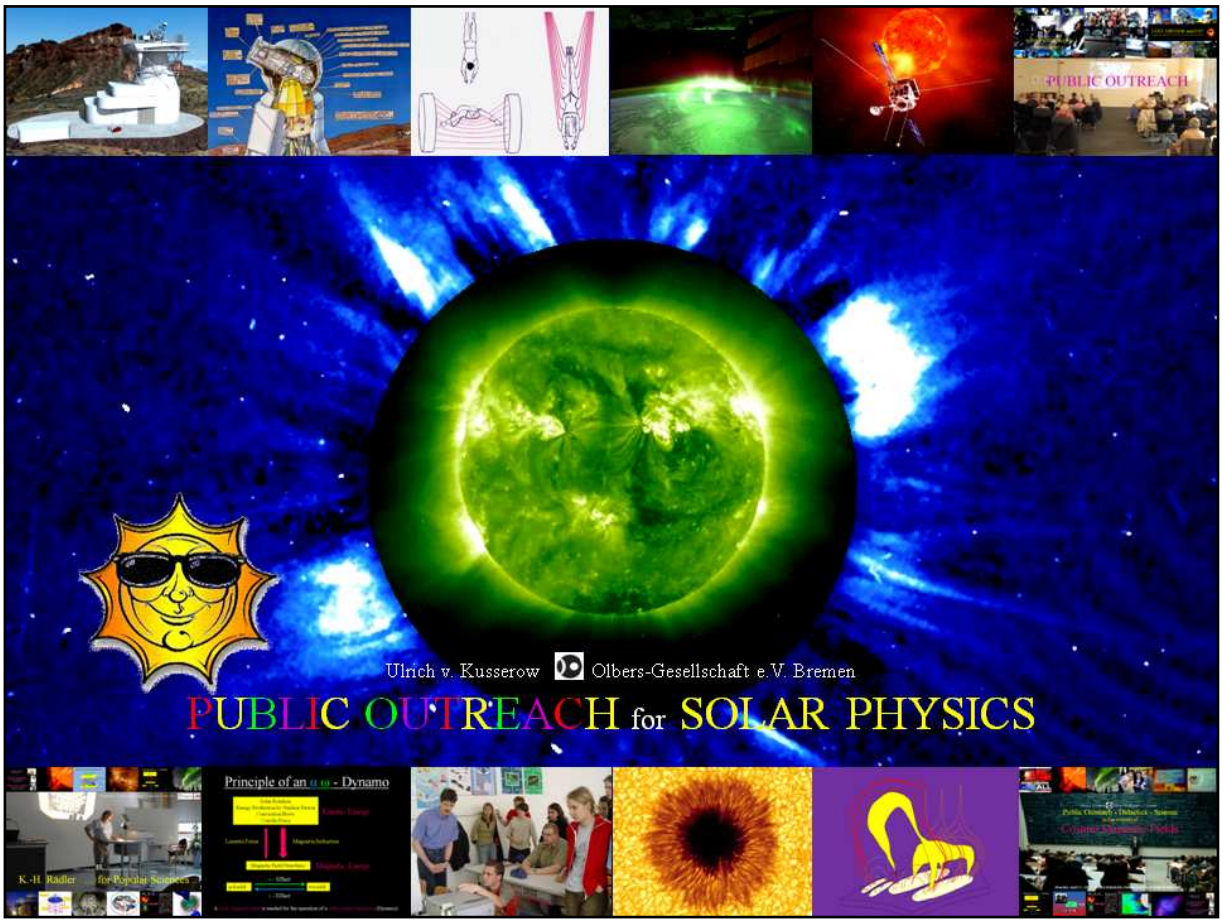


**Credit:** NASA, EST/EAST, LEST-Foundation, E. Kippenhahn, NASA (2), U. v. Kusserow (4), SST, U. v. Kusserow (2)

# Public Outreach for Solar Physics

Ulrich v. Kusserow, Olbers Society Bremen

There are a lot of very good reasons for exploring the physical processes which are working in the interior and atmosphere of our Sun. We are "**Living with a Star**", that enables our existence, provides us with energy, is the climate driver on our planet, and protects us against high energy particles from the turbulent surroundings in our Milky Way. The Sun is a brilliant, relatively adjacent Cosmic Laboratory especially, but not only for the study of the **Interaction** between moving **Plasma** matter and **Cosmic Magnetic Field** structures. Research results concerning **Dynamo Processes** for the generation of magnetic fields, **Magnetic Rekonnection** events which change large structure topologies, cause eruptions, accelerate particles and heat atmospheres as well as fruitful achievements in relation with the propagation of **Waves** and **Winds** as well as **Shock Front** actions are essential for a deeper understanding of structure formations, phenomenons and evolutions in planetary, stellar and galactic systems everywhere and for different times in our Universe. Beyond that, without these insights future constructions of fusion reactors like ITER or Wendelstein 7-X for example would never happen. The interest of the public in new results from **Solar Physics**, the **Fascination** generated by beautiful pictures and movies of the Sun made by new telescopes and satellites is growing. A rising number of people want to take **Responsibility** for the evolution of the **General Living Conditions** on Earth

In a time of fast developing modern media **Popular Science** is today well excepted in the public audience, contrary to the actually still decreasing interest of kids in the school for subjects like physics. In this connection it is surely one of the duties of scientist, a debt to the society who invests money and notice to their work, to motivate young scholars, for sure as well their students by carrying out attractive **Public Outreach** projects respectively by regarding **Didactical Aspects** in their **Educational Work**. Furthermore this could be personally fundamental for a **Satisfying Scientific Work** not to stay in a kind of ivory tower without any contact to the public, as well to scientist working in other fields. For the department as a whole such efforts are for sure as well important as an effective **Instrumentation for Propaganda**, to convince politicians, who can support and encourage their work not only financially in a sustainable way. Exploring the **Physics of the Sun** is a very fascinating and motivating business. The **Theories** are developed deeply, accepted **Models** can be tested analytically or with numerical

simulations, and real experiments are carried out. Like in school lessons, “life experiments in space” made with highly developed **Telescopes**, **Satellites** and **Detectors** produce a lot of **Observational Data** which can be compared with the results one can get by **Numerical** or real **Laboratory Experiments** to improve the understanding of our “Native Star”. To get a better idea about the functioning of **Space Weather** processes, **Heliophysics** will turn out to become one of the most important scientific realm for managing **Life in our Sun-Earth-System**.

This talk starts with some impressive pictures and video sequences hopefully convincing everyone, that the exploration of our Sun is a really indispensable task to do for a better understanding of our whole Universe and the conditions for Life on Earth. The importance of Educational Efforts and Public Outreach projects for the benefit of Solar Physics Research in so many ways will be emphasized in the second part of this presentation. After that, the special and today extensive role Cosmic Magnetic Fields play in so many parts of astrophysical research programs is the highlighted topic. What are the essential aspects of a didactically oriented approach to carry out satisfying educational demands in different occasions of advertisement for your science? Why, where and how can and should you perform Public Outreach to aid the Progress in Solar Research and your personal well-being? These are the questions that shall be answered extensively and concretely in detail by using examples in the following two parts. Series of beautiful and fascinating pictures in a closing résumé will bring some relief at the end of the talk.

## Summery of the talk

1. **Live on Earth**, the **Sun** and the **Universe**
2. **Science**, **Education** and **Public Outreach**
3. All about **Cosmic Magnetic Fields**
4. **Didactical Aspects** of Solar Physics
5. **Public Outreach** for Solar Physics
6. A Résumé about the **Fascinating Sun**

**Further Informations** about the talk you can get from

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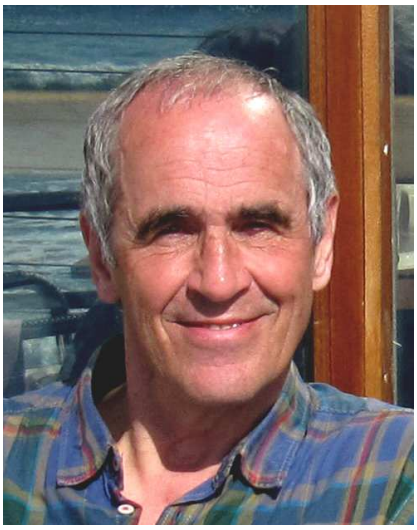

After his academic studies of astrophysics (diploma thesis with the title “Stationary Spherical αω-Dynamos and the Earth Magnetic Field”) Ulrich v. Kusserow taught as a teacher in grammar schools. For many years he was the chairman of the Olbers Society in Bremen. He is a member of the Astronomische Gesellschaft (AG) and the German Physical Society (DPG). For several years he took part in the Institute for Didactics of Physics at the University of Potsdam working about the subject “Space Weather - Learning about Cosmic Magnetic Fields”. Since many years he is guiding a working group about solar physics in the Olbers Society, where he is as well in charge of a laboratory experiment on solar physics for advanced students of the University Bremen. He writes articles and gives talks primarily on didactical aspects of modern astrophysics in subject areas like solar and cosmic magnetic fields, space physics, formation of planets, stars and galaxies as well as environmental and climate problems. He works as well in the framework for the skill enhancement of teachers. As a regular guest he today collaborates in the “Astroparticle Seminar” at the Jacobs University in Bremen. He is supporting the Bremen PALAZZI publishing company in producing their annual “Star Time” calendar, the German Aerospace Center (DLR) in Bremen in arranging their “Observing the Sun” school lab experiment and in developing an appropriate didactical concept for that.