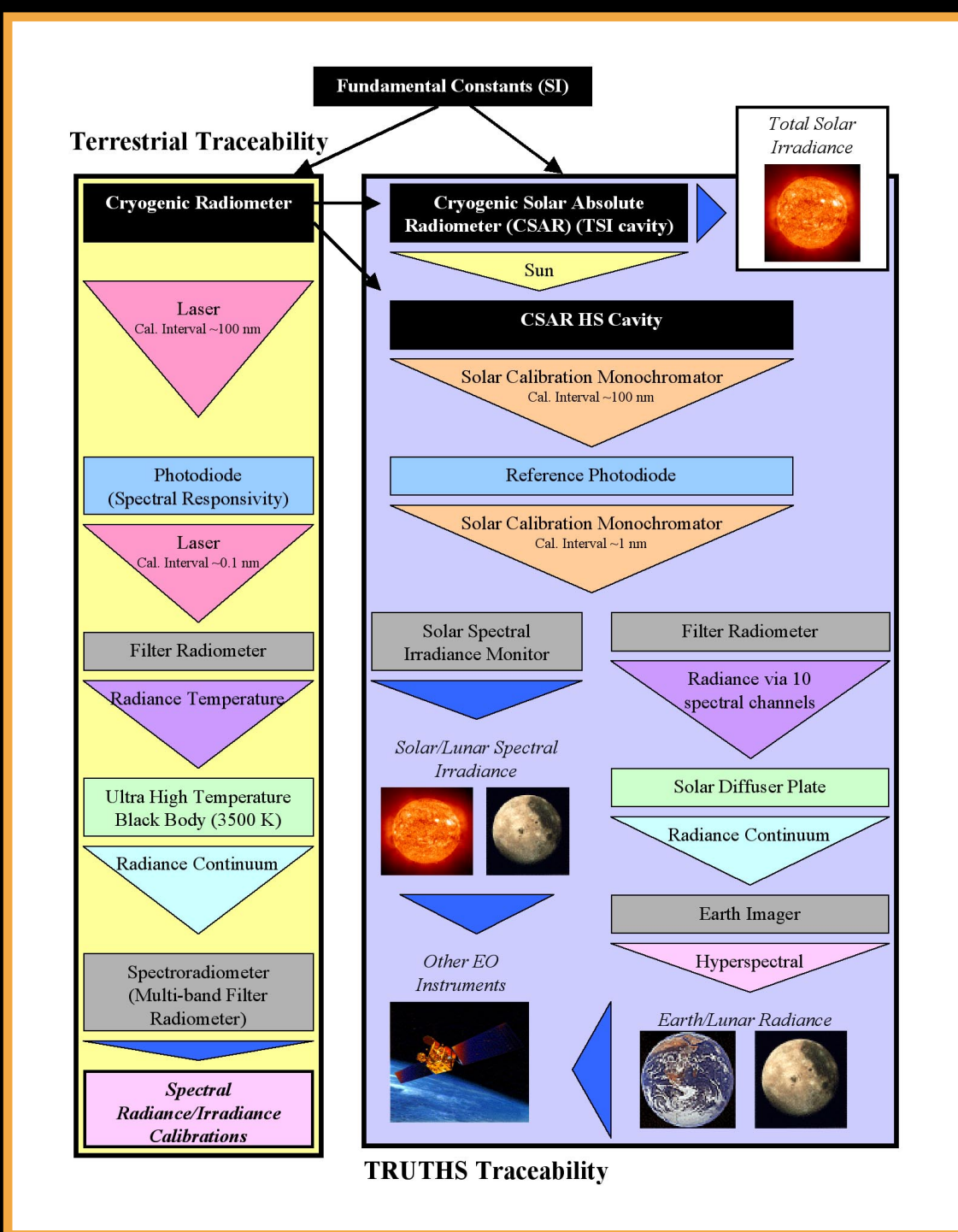
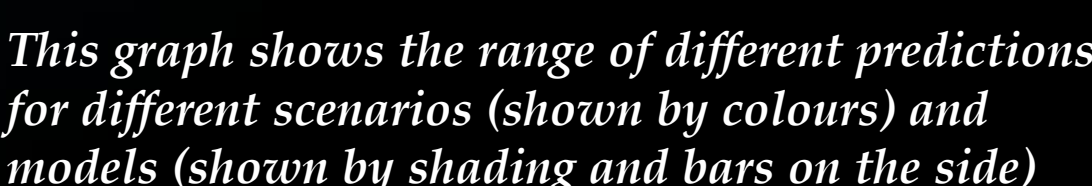


Nigel Fox, Emma Woolliams, National Physical Laboratory, Queens Road, Teddington, Middlesex TW11 0LW

Two instruments on a recent mission agreed with each other on the ground, but disagreed by more than 10% in orbit. They were designed to agree better than 3% to fulfil their scientific objectives.

This uncertainty makes it difficult for governments to make critical economic decisions.



- a satellite mission proposed to ESA by an international scientific team, led by NPL.
- able to measure the incoming radiation from the Sun and the reflected radiation from the Earth and Moon, 10 times more accurately than any previous mission.
- the first satellite that will calibrate itself in space, directly traceable to SI units via a primary standard.
- unique in its goal to transfer its high accuracy to all other satellite missions measuring optical radiation. It will do this by calibrating optical radiation from "reference" targets such as the Moon, or large uniform areas, like deserts, on Earth that other satellites can then view to calibrate their instruments.

Thermometer

Black Cavity

Shutter

Heater

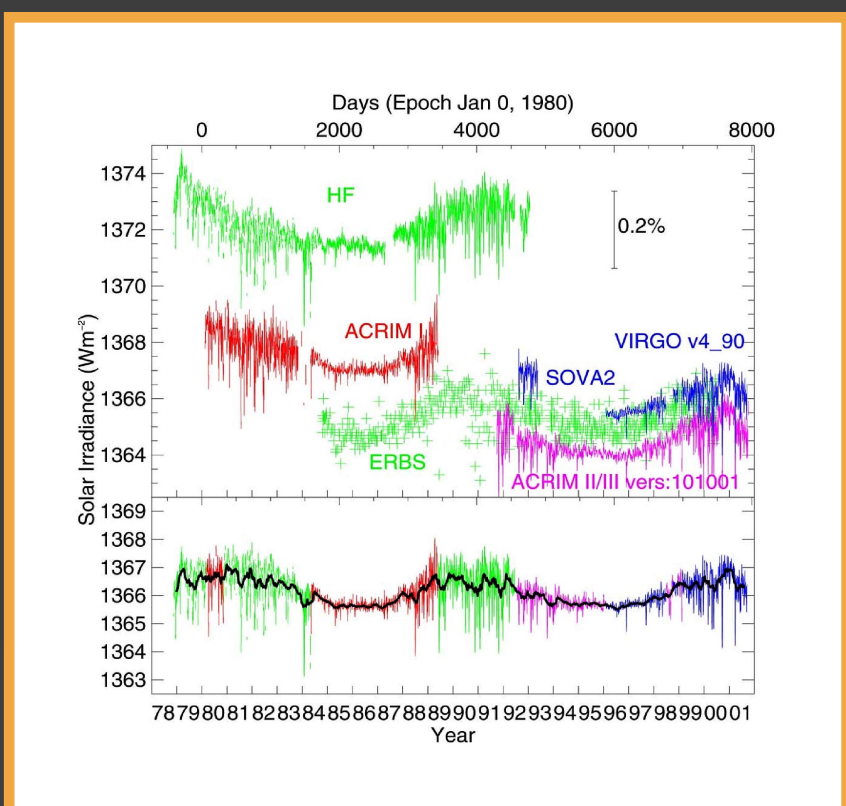
Cooler

A schematic of TRUTH Cryogenic Radiometer

A detailed historical painting depicting a bustling harbor scene. In the foreground, a horse-drawn carriage is being pulled by a team of horses. Several figures in period clothing are walking on the shore. A large, dark, multi-masted ship is docked at a quay. In the background, a large, ornate building with a central tower and a flag flying from its roof stands prominently. The scene is set in a harbor with other smaller boats and figures visible in the distance.

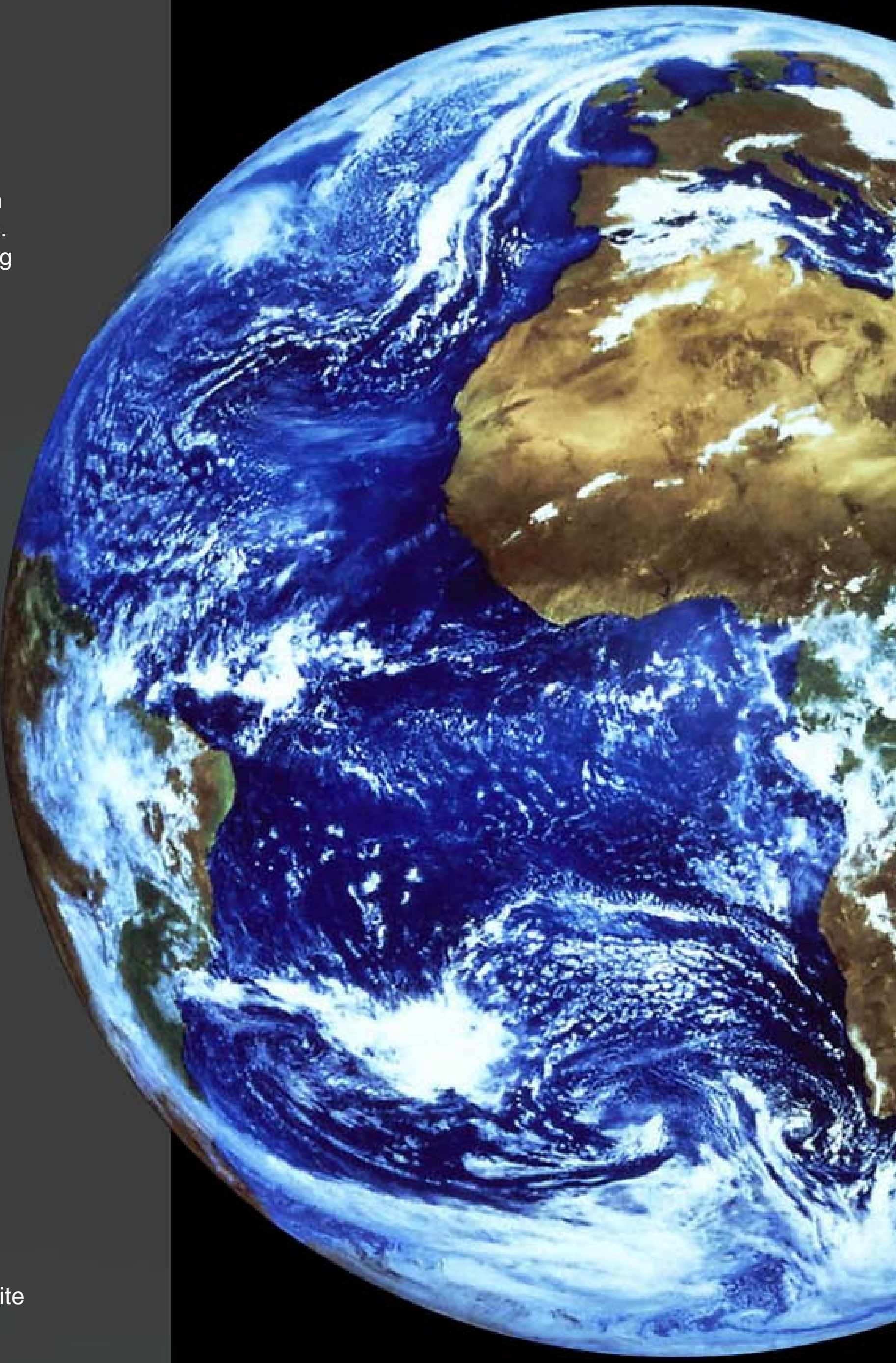
*A Frost Fair on the Thames
at Temple Stairs by
Abraham Hondius, 1684*

The Thames froze regularly during the Mini Ice Age.



Satellite measurements of total solar irradiance, showing a 0.1% variability. But the satellites have offsets of 0.5%.

TRUTHS will improve our knowledge by more than a factor of ten.



photographs of Sun & Earth: ESA

Brightwell Instruments Ltd, UK • Bureau International des Poids et Mesures • Canadian Centre for Remote Sensing, Canada • Centre National d'Etudes Spatiales, France • Imperial College of Science, Technology and Medicine, UK • Jobin-Yvon Group, France • Joint Research Centre, Italy • Logica, UK • OHB-System Bremen, Germany • OIP Sensor Systems, Belgium • ONERA, France • Plymouth Marine Laboratory, UK • Rutherford Appleton Laboratory, UK • TNO TPD, Netherlands • University of Oxford, UK • University of Reading, UK • University of Zurich, Switzerland • World Radiation Centre, Switzerland • United States Geological Survey, USA • University of Alabama, USA • University of Arizona, USA • Naval Research Laboratory, USA

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