**An SI-Traceable Space-based Climate Observing System**

A CEOS, WMO-GSICS Workshop
to be held at: National Physical Laboratory, London, UK, September 9-11, 2019

 **1st ANNOUNCEMENT AND CALL FOR CONTRIBUTIONS**

Recent years have seen an increasing urgency from the worlds’ space agencies and international coordinating bodies such as CEOS, WMO-GSICS and GCOS to establish a space-based climate observing system capable of robustly monitoring indicators of change in the Earth’s climate and results of international mitigation strategies such as the Paris climate accord 2015. Such an observing system, spanning the electromagnetic spectrum, requires the combined and coordinated efforts of the world’s space agencies. Whilst building on capabilities and data from heritage, existing and under-development space assets, there is a recognition that for these to deliver data that can be considered unequivocal on decadal time-scales, facilitating policy makers to take decisions in a timely manner, requires some improvements. In particular, observations need to be of sufficient accuracy, tied to an invariant reference through International system of Units (SI traceability), and sampled to ensure global representativeness so that they can allow change to be detected in a short a timescale as possible. Critically, SI traceability must be evidenced in space and for the lifetime of the mission collecting data.

The harshness of launch and space environment, has to date, placed a limit on any satellite missions’ ability to robustly demonstrate SI traceability in-orbit at the accuracy and confidence levels needed. **Typically an order of magnitude improvement is required!**

Although not as demanding in terms of accuracy, achieving such a system would also facilitate improvements to many operational applications particularly where harmonisation of data from different satellites, interoperability, would allow the supply of ‘information on-demand’ for a wide range of applications -impacting health, sustainable food supply, and pollution to name a few.

This workshop aims to develop a community strategy ‘white-paper’ to quantify benefits and consequential specification of such a system and a roadmap to how it might be achieved.

It seeks to bring together expertise from policy makers, space agencies, industry and academia to:

* consider potential scientific and economic benefits,
* the state-of-the-art in establishing traceability in orbit: current technologies, methods and missions e.g. CLARREO (and its Pathfinder), TRUTHS and Chinese counterparts
* New ideas!

The workshop will be fully open (early pre-registration required as places will be limited) and structured to ensure time for broad discussion on all topics stimulated from both invited and contributed inputs and in both oral and interactive formats. It is expected that the introductory session will be suitable for a broad audience, followed by more detailed technical discussions with the final day focussing on the development of a consensus and draft strategy. The latter will require some pre-workshop activities.

Formal contributions are requested related to the following themes, which will form the basis of sessions in the workshop and span the full electromagnetic spectrum (UV – Microwave) although it is anticipated that it will primarily focus on the optical domain UV-TIR.

* *Science + Societal drivers- climate and operational (including economic benefits)*
* *Observations and datasets needed (measurements; timescales; accuracies)*
* *Reference Calibration (approaches/Uncertainty studies etc)*

*• Mission/technologies/concepts under development or conceived of (status, technical characteristics)*

*• Develop community ‘white paper’ on benefits needs and an ‘ideal’ international architecture*

Please register at [www.blahblahblah.npl.c.uk](http://www.blahblahblah.npl.c.uk) and submit your abstract online by March 31, 2019 where it will be reviewed by the scientific organising committee. It should be around 300 to 500 words, and make clear how it contributes to the scope and themes of the workshop.

Scientific Organising Committee consists of: Nigel Fox (NPL), Bruce Wielicki (NASA), Greg Kopp (U.Colorado/LASP), Xiuqing (“Scott”) Hu (CMA), Tim Hewison (EUMETSAT)