Special session
Measuring Greenhouse Gases from Space: Past, Present, and Future

- What was the most challenging/difficult or joyful moment during your tenure? / What was the key to leading your mission to success?

- What do you see as the key challenges over the next 10 years? / What collaboration within the community do you want to propose to meet these challenges?

- What is the message for the members in the community, especially students and next generation career researchers/engineers?

Panelists:

Dr. David Crisp
former OCO science lead,
Crisp CEO of Spectra, LLC

Dr. Tatsuya Yokota
former GOSAT project leader,
NIES

Dr. Akihiko Kuze
former GOSAT-2 project
manager, GORadS CEO

Akihiko KUZE

Born; Oct. 1963 in Tokyo, Japan.

1986, BS; Geophysics, The University of Tokyo.

1988, MS; Geophysics, The University of Tokyo.

2003, DSc; Earth and Planetary Science, The University of Tokyo.

1988-2002, Space systems division, NEC Corporation

1992-1993, Harvard-Smithsonian Center for Astrophysics

2002-, GOSAT project team, JAXA

2019-, GOSAT-2 project team, JAXA

2025-, CEO, GORadS, Inc.

What was the most challenging/difficult or joyful moment during your tenure? / What was the key to leading your mission to success?

- Engineers should make as many drawings as possible, then test and characterize their instruments with their responsibilities before and after the launch.
- Scientists should understand there is no perfect instrument, no perfect operation.
- Your boss is not always helpful. International collaboration often works and friends have suggested a lot.

Tatsuya YOKOTA

- Apr. 2006 – Mar. 2016 NIES GOSAT Project Leader
- Apr. 2016 – Mar. 2021 NIES Fellow
- Apr. 2017 – Mar. 2022 Prof. of Toyo University (Civil System course)
  - Lecture: GIS, Quality of Life Theory (on Global Environment Issues), Practice of Information Networking
- Apr. 2021 – (present) Visiting Researcher of the NIES/SOC
- Apr. 2022 – (present) Program Officer of ERCA, Japan
  - Role: Progress Management of ERTDF Research Projects funded by the MOE
    - ERCA: Environmental Restiration and Conservation Agency
    - ERTDF: Environment Research and Technology Development Fund
    - MOE: Ministry of the Environment, Japan
    - Many GHG researchers in Japan are supported by ERTDF of MOE and Grants-in-Aid for Scientific Research of MEXT.

What was the most challenging/difficult or joyful moment during your tenure? / What was the key to leading your mission to success?

- **Biggest challenge** – Measuring GHGs from space with target precision/accuracy
- **Most joyful moment** – Achieved our goals reasonably with team members and collaborators
  - Long-term measurements of GOSAT (by overcoming several satellite and sensor crisis situations, thanks to keeping satellite operation and control, and useful suggestions from international collaborators to the GOSAT project)
- **Key leading to mission success** – Steady preparation and to think about the flexible best possible efforts to any encountered problems, and to keep each strong will to accomplish the mission

David Crisp

Born; Long ago, on a nearby planet

1977, BS; Education, Texas A&M University.

1984, PhD; Geophysical Fluid Dynamics, Princeton University.

1984-1986, Postdoc, Caltech, Venus VEGA Balloon Team

1986 - 2022, Scientist, Jet Propulsion Laboratory/Caltech

HST WFPC-2, Voyager, Mars Pathfinder …

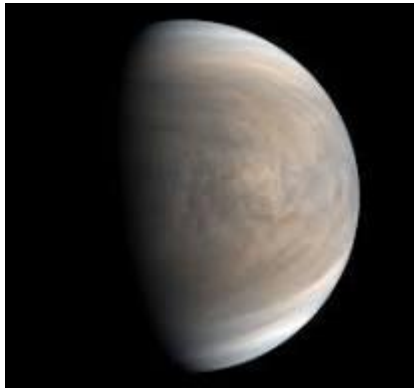
2001 - 2009, OCO Principal Investigator

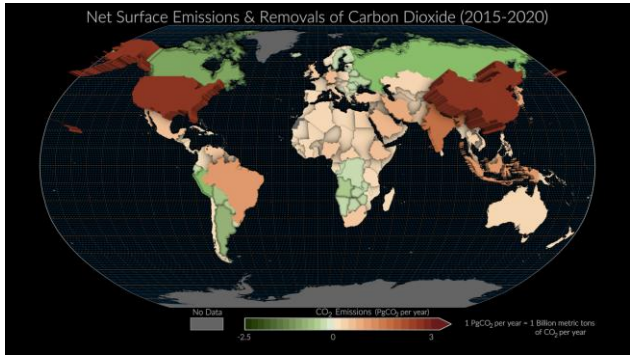
2009 – 2014, ACOS/GOSAT Team Leader

2010 - 2022, OCO-2/OCO-3 Science Team Leader

2022 -, Crisp Spectra LLC, Owner and CEO

2024 -, Member, JAXA CEOS –SIT Chair Team





What was the most challenging/difficult or joyful moment during your tenure? / What was the key to leading your mission to success?

- **Biggest challenge** – Loss of the original OCO mission
- **Most joyful moment** – response to the loss of the OCO mission
  - Invitation to join the GOSAT team
  - Letters of support from the U.S. National Research Council and others
- **Key leading to mission success** – Inclusion of the entire community in this effort

What do you see as the key challenges over the next 10 years? / What collaboration within the community do you want to propose to meet these challenges?

- Government space programs always have risks of cancellation.
- Less and less politicians talk about climate change: rice price is better than CO_2 reduction.
- Up to now, remote sensing business has not been profitable except for defense use. Big space companies show no more interest in earth observation.
- Satellite program is not a sanctuary. Think about your original observation method.

What do you see as the key challenges over the next 10 years? / What collaboration within the community do you want to propose to meet these challenges?

- **Key challenges over the next 10 years**
  - To keep space-based GHG measurements and domestic/international collaborations
  - Constellations of many (ground-, ship-, airborne-, space- based) GHG measurements, and to acquire objective, scientifically accurate analysis data in order to contribute to the sustainable future of humankind

What do you see as the key challenges over the next 10 years? / What collaboration within the community do you want to propose to meet these challenges?

- Maintaining mission and data continuity and improvements in GHG products

- Encouraging the use of space-based GHG products by stakeholders in the national inventory and policy communities

What is the message for the members in the community, especially students and next generation career researchers/engineers?

- Girls and boys, be ambitious.
- Travelling abroad is not enough. Live, study, and work in foreign countries.
- If you do not think you have a special talent, work hard. All my mentors had worked 365 days a year.
- Study not only geosciences, but also solar physics, biology, even world history.

What is the message for the members in the community, especially students and next generation career researchers/engineers?

- **Messages to the community members, especially to young researches**
  - Research is a fight against the unknown issues. You never know what's going to happen in your work. You may get success or fail in your job. In the midst of the abundance of information, please constantly investigate and ask yourself **what is the truth and optimal method, and proceed with your research in your own style, with a strong will, and flexibly**.

What is the message for the members in the community, especially students and next generation career researchers/engineers?

Collaboration is needed to address these challenges

- Greenhouse gas emissions from fossil fuel use and other human activities is a global problem that demands a global solution.

- Learn to work with others - A strong collaboration across space agencies, science communities and stakeholder communities is needed to address this problem from a scientific perspective