

Stratosphere-troposphere Processes and their Role in Climate (SPARC)

43rd Session of the WCRP Joint Scientific Committee

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Online



SPARC
Stratosphere-troposphere
Processes And their Role in Climate



Leadership and operations

Change in SPARC leadership

- Neil Harris (co-chair) stepped down at the end of 2021.
- New co-chairs are Amanda Maycock (University of Leeds, UK) and Karen Rosenlof (NOAA, USA).
- Two new members joined the SSG – Sophia Szopa (France) and Wenshou Tian (China).

SSG nominations for Jan 2023

- SPARC is nominating Marc von Hobe (Germany) and Martin Jucker (Australia) as new SSG members starting 1 Jan 2023 – replacing two current SSG members.
- SPARC is proposing to renew the SSG membership for another 2 year of Nathaniel Livesey and Wen Chen (until 2024).
- Co-chairs still in contact with another potential SSG member – Sarah Osima (Tanzania).

SPARC IPO

- Sabrina Zechlau joined the SPARC IPO in August 2021 as Project Scientist.
- Mareike Heckl left on parental leave and will return to the office (part time) on 4 July 2022.
- Stefanie Kremser stepped in to cover for Mareike while on leave – her contract finishes on 31 October 2022.
- LoA 2022 between WMO and DLR is in the process of being signed.

Scientific Steering Group

Current SPARC SSG

SPARC co-chairs

Karen	Rosenlof	USA
Amanda	Maycock	UK
Seok-Woo	Son	Korea

SSG members

Gufran	Beig	India
Sophie	Szopa	France
Wenshou	Tian	China
Andrea	Carril	Argentina
Wen	Chen	China
Nili	Harnik	Israel
Harry	Hendon	Australia
Takeshi	Horinouchi	Japan
Nathaniel	Livesey	USA
Michael	Prather	USA
Viktoria	Sofieva	Finland
Don	Wuebbles	USA



Progress and achievements

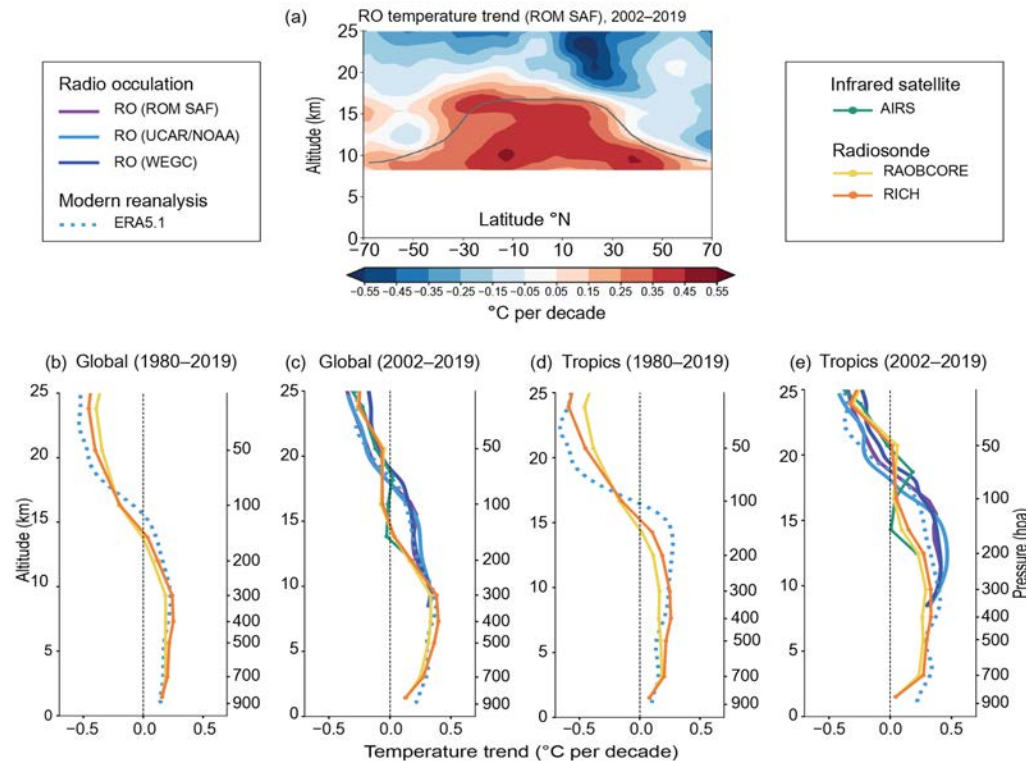
IPCC AR6 WGI contributions

- “The **troposphere has warmed** since at least the 1950s, and it is virtually certain that the **stratosphere has cooled**. In the Tropics, the upper troposphere has warmed faster than the near-surface since at least 2001, the period over which new observation techniques permit more robust quantification (medium confidence). It is virtually certain that the **tropopause height has risen globally over 1980–2018**, but there is low confidence in the magnitude.” (IPCC WG1 AR6, 2021).

2022 Ozone Assessment contributions

- Updated trends of the stratospheric ozone vertical distribution (LOTUS activity).
- Community chemistry-climate simulations to provide updated ozone recovery projections (CCMI).

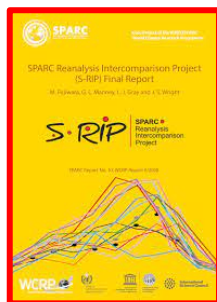
Atmospheric temperature trends



Progress and achievements

SPARC activities

- **Encourage the use of SPARC data sets** among WCRP activities such as (i) high vertical-resolution radiosonde data (available at CEDA); (ii) CMIP6 solar forcing data set; and (iii) GLoSSAC (Global Satellite-based Stratospheric Aerosol Climatology, available at EarthData).
- Promote the **DynVarMIP diagnostics** which is a part of the CMIP6 database, which are crucial for understanding the stratosphere-troposphere dynamics and its response to climate change.
- Overview paper on ‘Estimating and **reporting uncertainties** in remotely sensed atmospheric composition and temperature’ by TUNER.
- Six core **papers analysing QBOi phase-one experiments** are now all published in a Quarterly Journal of the Royal Meteorological Society Special Issue on QBO modelling. A QBO review paper is currently under review.
- **Two community papers** by SNAP - Stratospheric biases in S2S forecast systems & Damping experiments.
- Involvement in field campaign ACCLIP (Asian Summer Monsoon Chemical and Climate Impact Project) by ACAM & rapid response to Hunga Tonga eruption in Jan 2022 by SPARC SSiRC community.
- Over **52 paper published** in the inter-journal special issue on "The SPARC Reanalysis Intercomparison Project (**S-RIP**)“.



Final S-RIP report (**SPARC Report No. 10**) has been published and is available from the SPARC website.



SPARC strategy – next 5-10 years

SPARC Mission

SPARC supports its community to address pressing science questions relevant to our rapidly changing planet. In a world where atmospheric and climate sciences are increasingly a focus of decision-makers across policy and industry, SPARC has **an opportunity to leverage its community strength to provide the foundations of the knowledge, data, and information required to transform our society in the next decade**. This will be rooted in SPARC's support for cutting edge fundamental sciences, alongside dedicated efforts to strengthen partnerships and to demonstrate the societal benefits arising from SPARC's work.

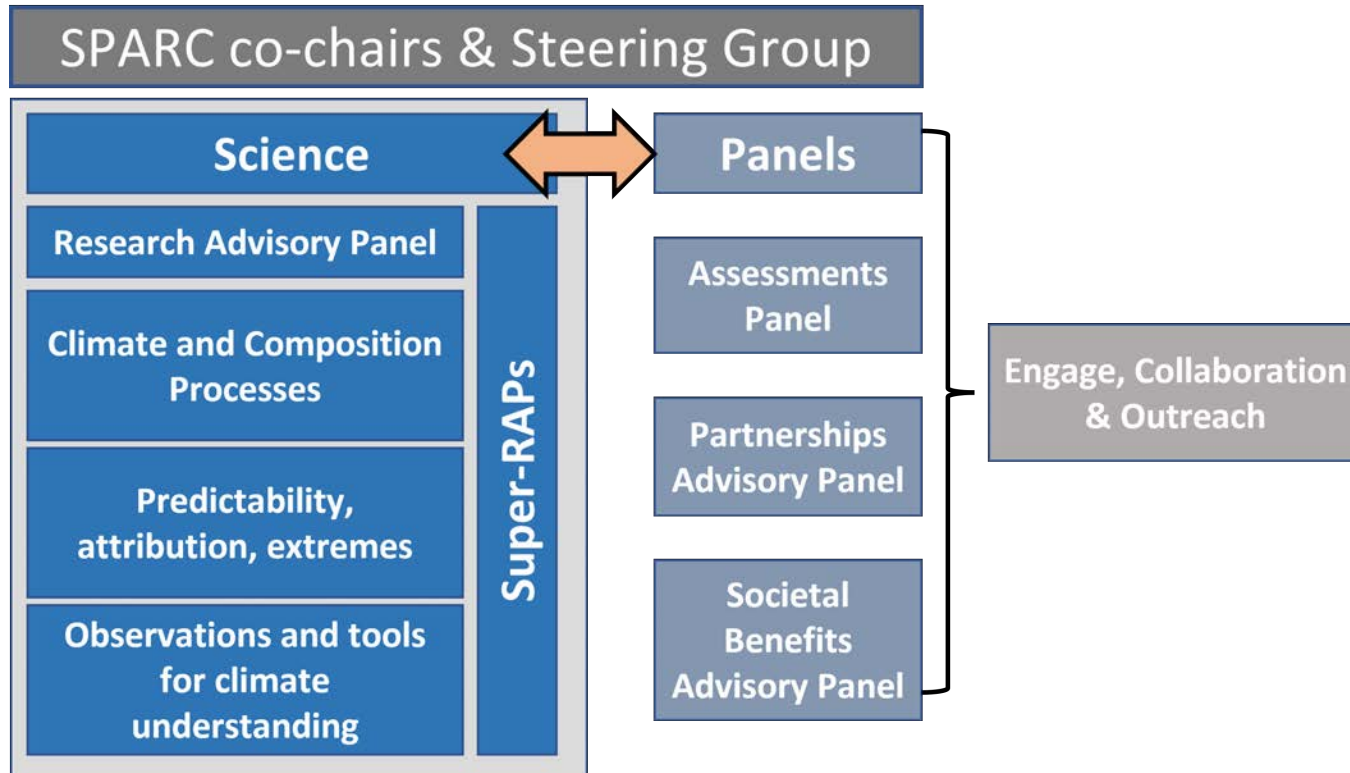
SPARC's Vision

To establish a comprehensive body of **scientific knowledge on the role of the atmosphere in the global climate system** with an emphasis on process understanding.



Future plans

New SPARC strategy in consideration: proposed restructuring of SPARC



Future plans

Shorter term (1-3 years)

- SPARC will review its name to better present the ‘whole atmosphere’ focus.
- SPARC’s new strategy includes a **‘Partnership Advisory Panel’** comprising external representatives from other WCRP groups and organisation with whom SPARC wants to collaborate/engage. The Panel will take strategic leadership of the connections between SPARC and other groups, focusing on opportunities, synergies, and co-benefits.
- SPARC has representatives in four out of five LHAs that ensure the link between work done by SPARC activities and what is needed by the LHAs.
- SPARC representatives involved in WCRP task teams to ensure collaboration.

Longer term (4 – 10 years)

- Ensure that SPARC sciences support the WCRP LHAs.
- Contribute to the renewed priorities of WCRP and increase SPARC’s ability to remain agile in a rapidly changing scientific landscape.
- Strengthen SPARC’s partnership with the wider science community.

Connection/Collaboration to other activities

WCRP Lighthouse Activities & new core projects

- SPARC ATC activity has clear links to Explaining and Predicting Earth System Change and new ESMO core project & interest in getting involved.
- DynVar activity has clear links to My Climate Risk.
- S2S has links to the My Climate Risk and to two core activities: Earth System Modelling and Observations (ESMO) and Regional Information for Society (RIFS).

WCRP tasks teams

- Andrea Steiner (ATC activity) joined the 'Cycles and Budgets Task Team' as the SPARC representative while Takeshi Horinouchi (SSG member) joined the GPEX Tiger team.

Others

- CCMI contributes to Tropospheric Ozone Assessment Report – Phase Two (TOAR-II) activity of **IGAC** to define new model simulations and continues discussions with **AerChemMIP** about model experiments and analysis.
- Joined activities between SPARC activities such as online webinars or combined workshops.

Capacity building

ACAM summer school - 4th ACAM training school took place virtually – incl. 30 ECRs and students from 14 countries. Event incl. lectures, practical exercises, small student projects.



Upcoming events

Celebrating 30th Anniversary of SPARC – webinar series

This year marks the 30th anniversary of SPARC. In this time, SPARC has evolved into a major international research coordination hub for atmospheric sciences, with the primary goal to facilitate research that improves our understanding of atmospheric processes and their role in climate. To celebrate SPARC's achievements over the last three decades, SPARC organised a series of webinars.

7th SPARC General Assembly

- Three Hubs to lower carbon footprint.
- >300 submitted abstracts
- 6 scientific themes
- 16 confirmed invited speakers



SPARC 2022
7th General Assembly
24th to 28th October, at three locations
Boulder, USA · Reading, UK · Qingdao, China
Multi-hub for a lower carbon footprint

www.sparc-climate.org



Additional Slides

