



SPARC
Stratosphere-troposphere
Processes And their Role in Climate



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INTRODUCTION & WELCOME: SPARC TRAINING SCHOOL CLIMATE DATA ANALYSIS AND ARTIFICIAL INTELLIGENCE IN THE GLOBAL SOUTH

PROF. DR. MICHAELA I. HEGGLIN | DIRECTOR IEK | 29 OCTOBER 2023

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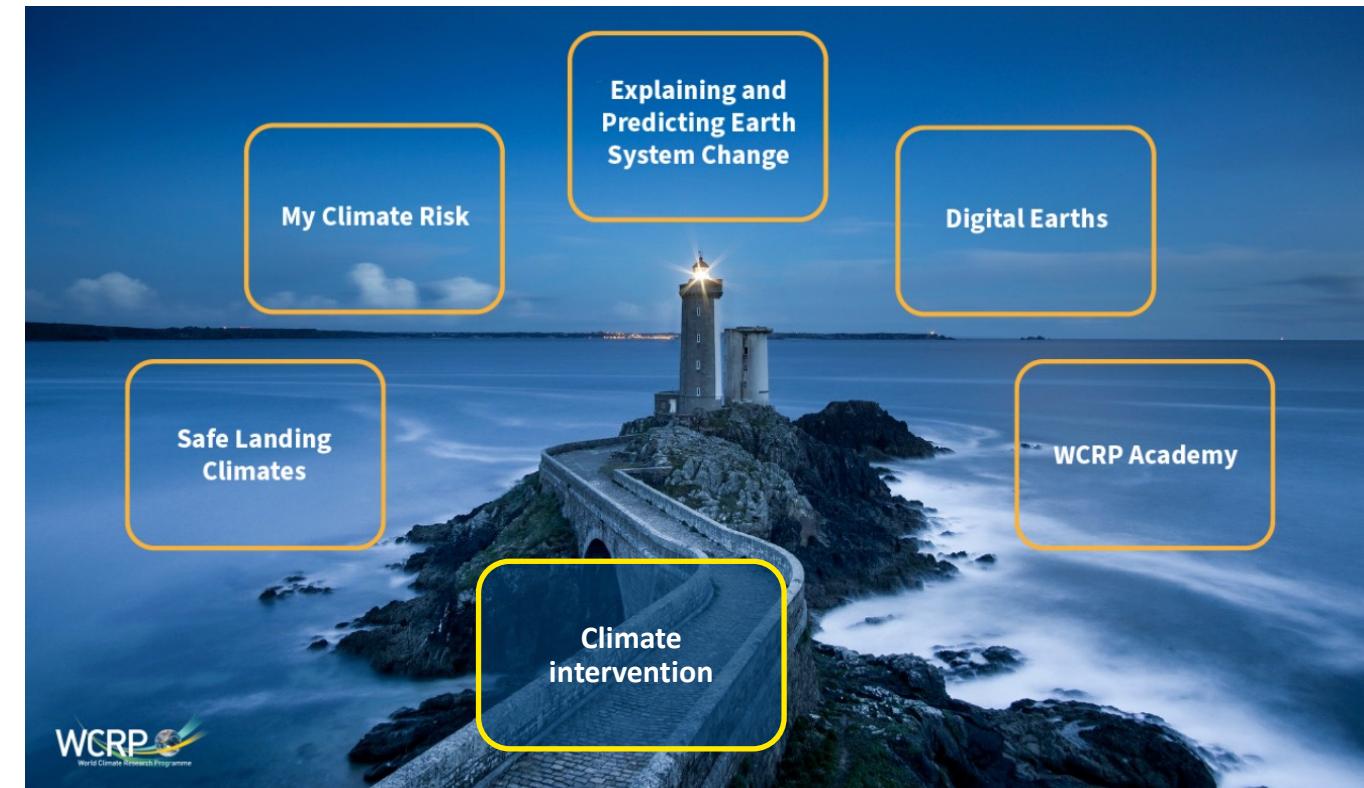
WORLD CLIMATE RESEARCH PROGRAMME – WCRP

MISSION The World Climate Research Programme (WCRP) coordinates and facilitates international climate research to develop, share, and apply the climate knowledge that contributes to societal well-being.



OBJECTIVES AND STRUCTURE OF WCRP

- The main **objectives**, set for WCRP at its inception and still valid, are to determine the predictability of climate and to determine the effect of human activities on climate.
- To achieve these objectives, WCRP adopts a multidisciplinary approach and organizes large-scale, observational and modelling projects, each of which focuses on aspects of climate too large and complex to be addressed by any one nation or individual scientific discipline.



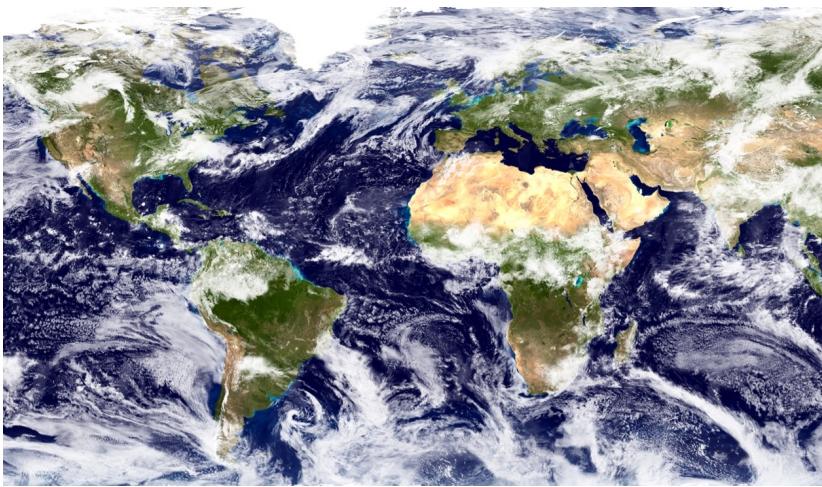


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SPARC THEMES



Studies the interactions between atmospheric composition and climate (or the ozone layer), with feedbacks on both dynamical and radiative processes throughout the atmosphere.



Atmospheric Dynamics and Predictability

Focuses on the understanding atmospheric dynamics and climate variability to provide better climate predictions on scales from seasonal all the way to centennial.

Chemistry and Climate



Long-term Records for Climate Understanding

Promotes the creation, analysis, and interpretation of long-term climate observations for the study of climate variability and trends.

ACTIVITIES

- Currently around 20 activities
- Self-organized
- Provide network opportunities centered on topical research
- Extended if new science questions arise
- Often publish reports
- Contribute to UNEP/WMO Ozone Assessments and to CMIP project



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SPARC PROJECT SUMMER SCHOOLS

- Organize and support of training schools
- Partly led by SPARC office, SSG members, or activity leads
- Travel support for ECRs
- Training of SPARC (climate and composition) relevant topics.

**SPARC 3rd ACAM
TRAINING SCHOOL
KUALA LUMPUR 2019**



**ICMA SPARC
TRAINING SCHOOL
CAPE TOWN 2017**



**SPARC CCMI
SUMMER SCHOOL
HONG KONG 2019**



THE NEW SPARC INTERNATIONAL PROJECT OFFICE

NOTE: SPARC WILL SOON BE APARC!!

WILL START IN JULICH GERMANY IN JANUARY 2024



Dr. Rolf Müller
IPO Director



Dr. Ines Tritscher
Scientific Officer



Dr. Moha Diallo
Outreach Officer



XXXX
Scientific Officer



INTRODUCTION TO THE HOST OF THE NEW SPARC IPO

FORSCHUNGSZENTRUM JULICH

INSTITUTE OF ENERGY AND CLIMATE RESEARCH & JULICH SUPERCOMPUTING CENTRE

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FORSCHUNGSZENTRUM JÜLICH



Funded 11th December 1956



2.2 km² Campus area



11 institutes with 80 subinstitutes



16 large-scale research facilities



Shareholders: Government (90%)
and state of NRW (10%)



> 7000 employees, thereof



3000 scientists
1200 PhD students

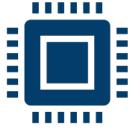
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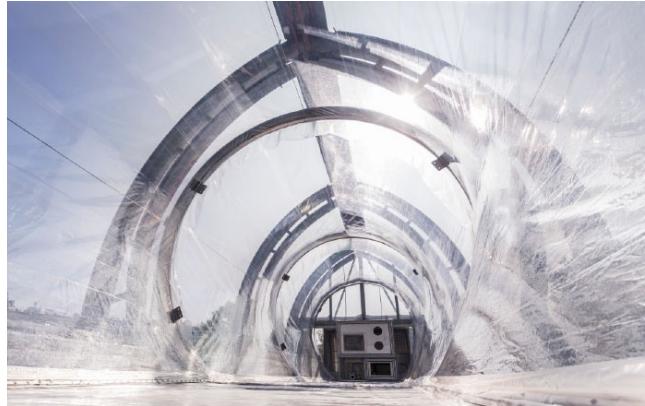
FORSCHUNGSZENTRUM JÜLICH

THREE STRATEGIC RESEARCH AREAS

Information



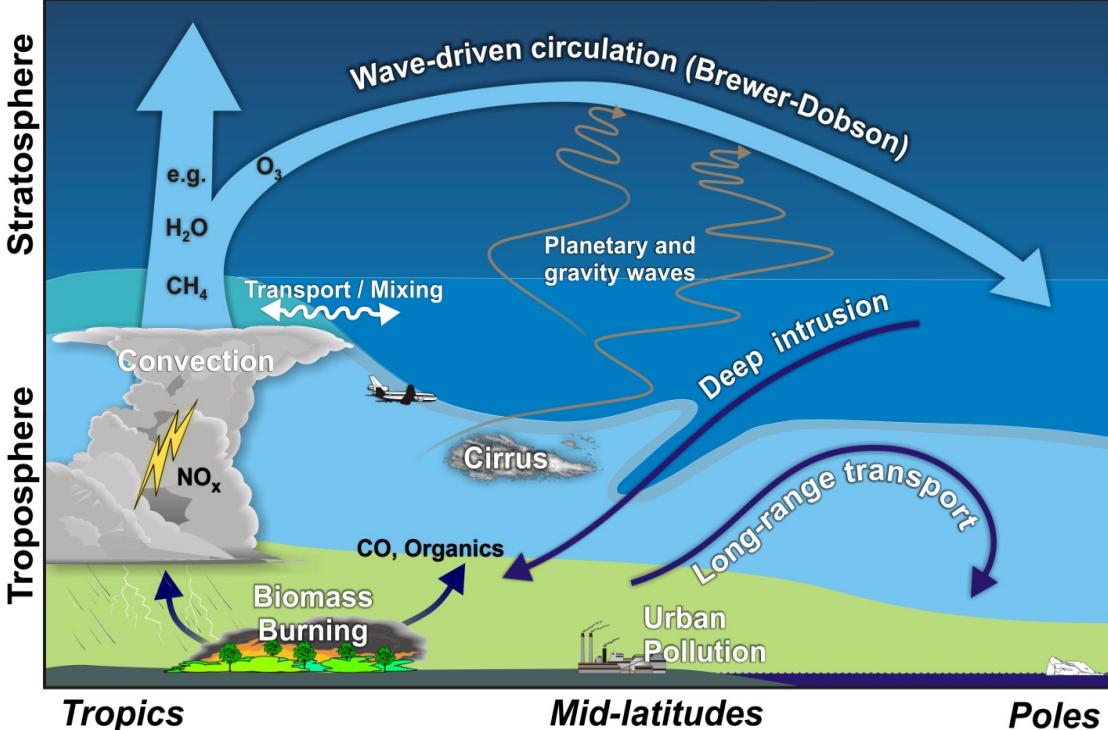
Energy



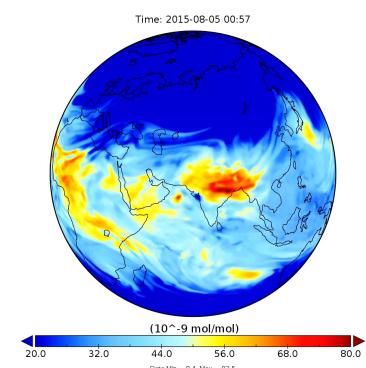
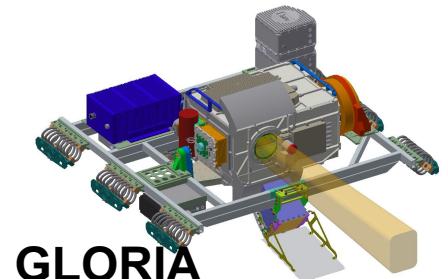
Bioeconomy



INSTITUTE OF ENERGY AND CLIMATE RESEARCH STRATOSPHERE (IEK-7)

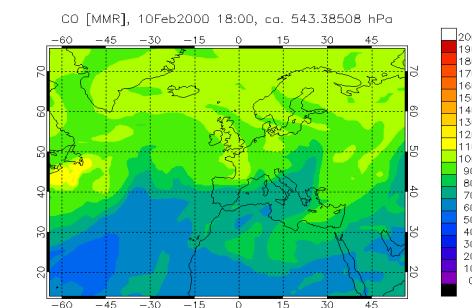
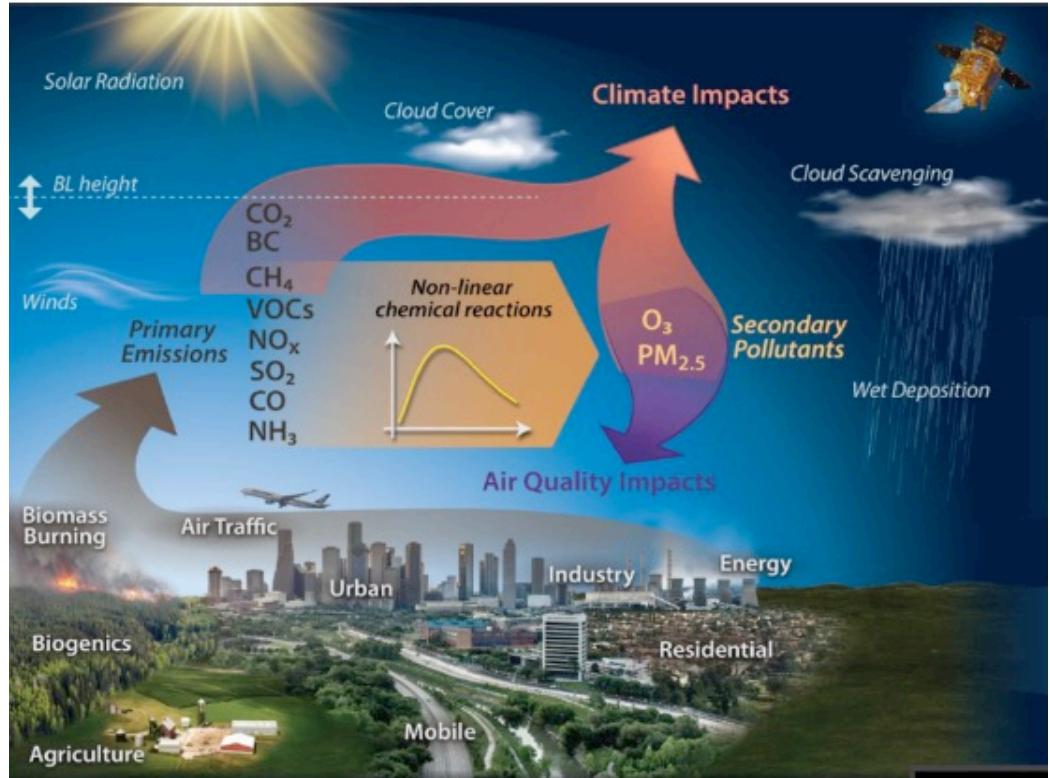


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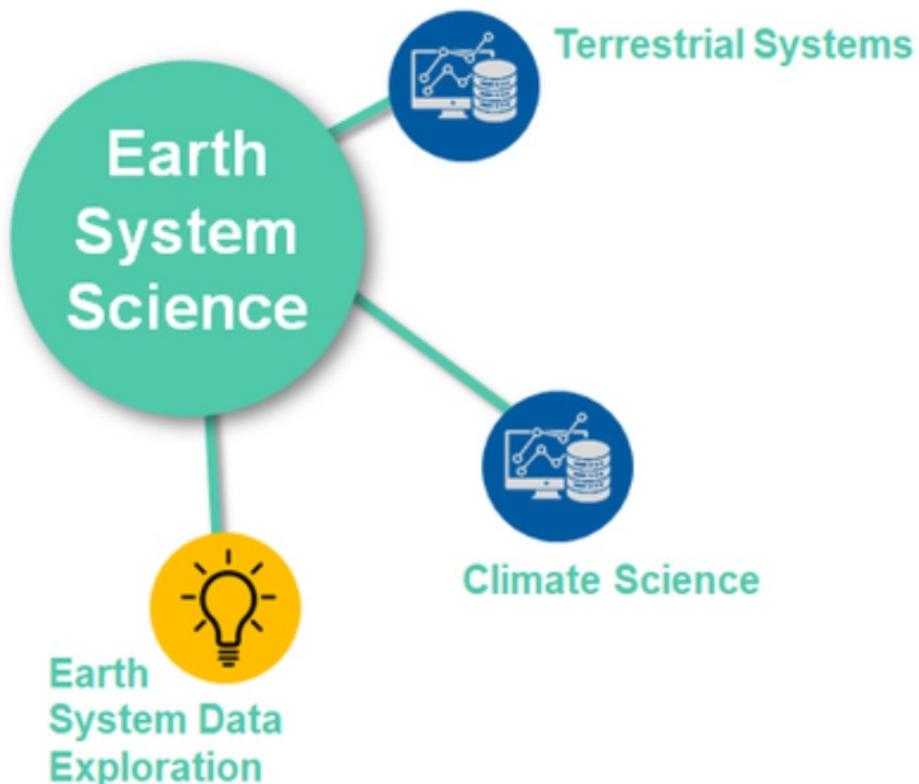
- Design and development of satellite remote sensing instruments
- Design and implementation of in-situ measurement systems on balloon & aircraft platforms
- Study of dynamical processes in the stratosphere & stratosphere-troposphere chemical & dynamical coupling
- Modelling of global & regional impacts of atmospheric processes on stratospheric composition, the stratospheric ozone layer & climate

INSTITUTE OF ENERGY AND CLIMATE RESEARCH TROPOSPHERE (IEK-8)

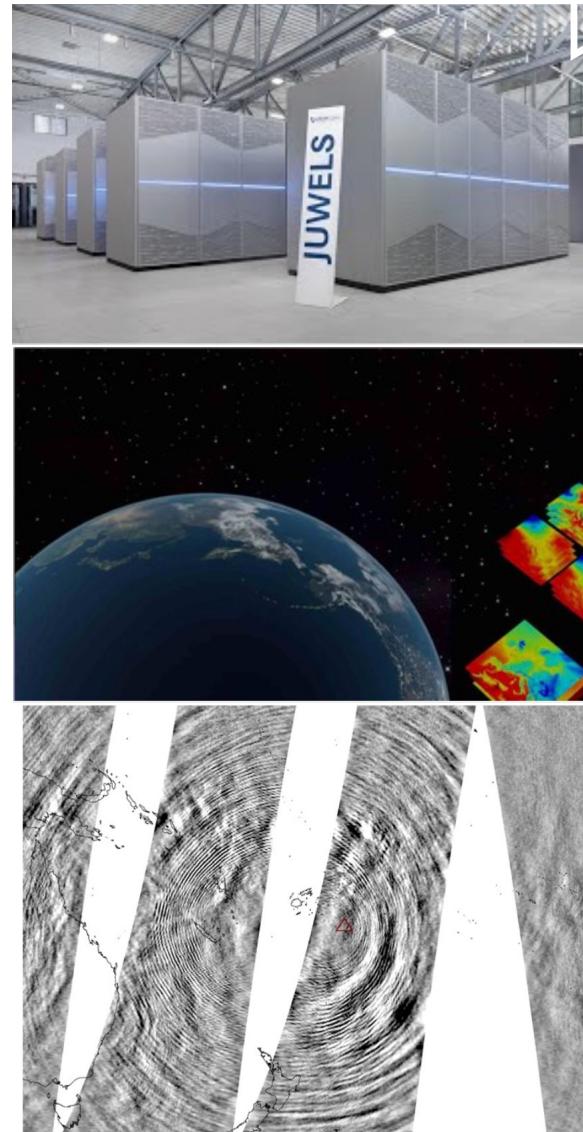


- Long term observations of tropospheric composition change
- Experimental studies of radical chemistry and atmospheric oxidation processes in the lower troposphere
- Gas to particle conversion, particle formation, and ageing
- Modelling of global and regional impacts of atmospheric processes on tropospheric composition, air quality, and climate

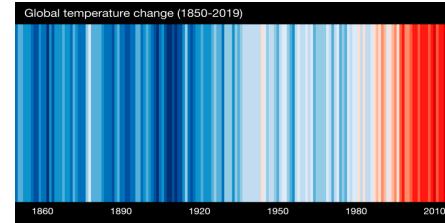
JSC: JULICH SUPERCOMPUTING CENTRE



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- **Supercomputers**
 - JSC was founded in 1987 as the first supercomputing center in Germany.
 - In 2024, JSC will start hosting JUPITER, Europe's first exascale supercomputer
- **Earth system simulations**
 - JSC provides computing time for numerical simulations at the highest performance class for science and industry in Europe.
 - Exploration of the latest HPC technologies, e.g. accelerators and quantum computing.
- **Earth system data analysis**
 - Three dedicated teams (~40 people) provide user support and conduct research in Earth system science.



THE IMPORTANCE OF OUR RESEARCH

- **Scientific Advancement:** Climate research pushes the boundaries of scientific knowledge and technology. It encourages interdisciplinary collaboration, leading to breakthroughs that can be applied beyond climate-related issues.
- **Solving Global Problems:** Climate change research presents an opportunity to contribute to solving one of the most critical global challenges of our time.
- **Resilience and Adaptation:** Understanding atmospheric processes will provide crucial information to communities and regions to become more resilient in the face of climate-related challenges, such as extreme weather events.
- **Clean Energy Revolution:** Climate science (including air pollution research) has spurred a clean energy revolution. Scientists are at the forefront of developing renewable energy sources.



A BIG THANK YOU!

- to our sponsors **WCRP, SPARC, and FZJ**.
- to **Rwanda University** for kindly hosting us on their beautiful campus.
- to **Prof. Damien Hanyurwimfura and all his colleagues** for their support and support.
- to **Dr Jennifer Batamuliza** for her work behind the scenes.
- to **our Rwanda University technicians** for supporting the school.
- to **the scientific organising committee**, in particular Prof. Amadou Gaye.
- to **all lecturers** who have kindly agreed to teach at the training school!
- to **all attendees** for being here!!
- but most, to **Dr Mohamadou Diallo**, who has made this school possible through his hard work and determination!!!



WISH YOU AN INTERESTING WEEK AND LOTS OF FUN!!!!

