

# CURRICULUM VITAE - DR GERHARD HELD

(Prepared for SASAS, Nov. 2021)

**Born on 05 March 1944 in Vienna;** I grew up in the Russian-occupied Sector of post-war Austria; matriculated at the Bundesrealgymnasium Mödling in June 1962.

**October 1962 I enrolled at the University of Vienna** (studies of natural sciences; principal subjects: meteorology, geophysics, physics, and mathematics). **Doctoral Thesis:** "Untersuchung der Struktur der Wind- und Temperaturfelder im Bereich der Hohen Tatra" (Investigation of wind- and temperature fields in the vicinity of the High Tatra mountain range). Advisor: Prof Heinz Reuter (theoretical meteorology); accepted in July 1967. This was the first attempt to model the air flow across the High Tatra mountain range, which forms the border between Slovakia and Poland. Thereafter, followed the final oral exams (Rigorosum) with Prof H. Reuter (theoretical meteorology), Prof F. Steinhauser (general meteorology and climatology) and Prof Stetter (physics). After passing the exams in Psychology & Philosophy, I was finally **awarded my PhD on 08 February 1968.**

Between July 1963 and September 1965 I completed 5-7 week-long internships each at the Meteorological Research Laboratory Hohenpeißenberg in Bavaria (Germany), on the Fishing Research Vessel FFS "Anton Dohrn" in the North Sea (research contract with Hydrographical Institute, Hamburg) and on the Fishing Support Vessel FSB "Meerkatze" in the North Atlantic (research contract with the Sea Weather Bureau, Hamburg).

**My professional career started with a part-time job in October 1965** (until March 1967) in the Climatology Division of the Zentralanstalt für Meteorologie und Geodynamik (ZAMG), Vienna, being responsible for final cross-checks of the monthly climate observations from >200 manual observation stations in Austria, participating in solar radiation measurements and calibration, as well as assistant editor of the meteorological magazine "Wetter und Leben".

**In 1968 I completed my compulsory military service** in the Austrian Air Force. After three months of basic training, I was posted to the MET-office of a military airbase near Vienna, where the reconnaissance squadrons of helicopters & small fixed-wing aircraft were based. Besides routine aviation forecasts, I was also tasked with radio soundings and radar observations. An unpleasant experience was the "high-alert" combat situation when Russian troops threatened to cut across the eastern part of Austria from Hungary into Czechoslovakia.

**During February 1969,** I was offered a full-time position in the Bioclimatological Division of the ZAMG in Vienna, being in charge of the solar radiation network with 35 stations throughout Austria (mainly total radiation; calibration of instruments; data reduction and publication).

**In September 1970, I accepted a position as radar meteorologist** in the Atmospheric Physics Division of the then National Physical Research Laboratory, **CSIR**, Pretoria. I studied all aspects of thunderstorms and hail falls; I was responsible for running the *first S-band weather radar in South Africa*, as well as for the co-ordination of more than 3000 voluntary hail observers and the preparation of computer analyses. Furthermore, I had a close collaboration with various groups of the then SAWB (Forecasting, Climate, Library, etc), as well as with lightning experts from the CSIR's National Electrical Engineering Institute (NEERI) and National Institute for Telecommunications Research (NITR). Under the leadership of the Division Head, the late Dr Ernest A. Carte (Founding Member of SASAS),

we managed to manually integrate lightning strokes and hail falls with radar images of convective storm cells, and also provided the Department of Water Affairs with real-time radar information of heavy rainfalls in major catchments - an early attempt of “*Nowcasting*” by telephone. As our research of severe convective storm systems intensified, our Division together with technicians & engineers from NITR had developed in-house a pulse-pair processor (Doppler, to detect radial velocities), as well as digitized the S-band radar. In 1983, we finally convinced CSIR Management to invest in a triple Doppler radar system to record the airflow inside convective cells. I was responsible for the implementation of this triple Doppler radar facility (purchase of basic radars (two C-band EEC radars), siting, assembly, modification of radars (Doppler) and development of new hardware, development of software, etc.). Due to difficulties with the siting, the project was delayed and finally shut down by the new CSIR Management due to restructuring in April 1991 (despite financial support from the Water Research Commission !), before the third radar could be brought on-line! However, we did manage to produce a few dual Doppler radar observations to demonstrate the success of the project (published “post mortem” in SAJSci in 1992)!

As a result of the above mentioned restructuring of the CSIR as a whole, the former Air Pollution Research Group of the late Dr Eric Halliday was merged with the Atmospheric Physics Division under the newly created EMATEK Banner in 1981. At the time, I was the only meteorologist in the CSIR and therefore I was also appointed as project leader of the group which studied the air pollution and ventilation potential of regions destined for future industrial development (mainly coal-fired power stations). My task was to co-ordinate the meteorological measurements (meso-network and boundary layer studies), physical and chemical measurements, as well as theoretical studies (modeling of air pollution dispersion). Major projects included the investigation of meteorological conditions for the siting of the Mosselbay offshore oil platform (for the then Office of the Prime Minister: Physical Planning Branch), meteorological & chemical boundary layer studies (including the large-scale investigation of the Low-Level-Jet) on the Highveld, monitoring emissions from burning colliery discard dumps, acid rain monitoring (all for the then Department of Health), as well as joint projects with Eskom TRI. However, ongoing restructuring after the shut down of our radar facility, as well as the increasing pressure to substitute research with small air pollution contracts (“money-generating projects”) led to my resignation from EMATEK in April 1992.

**In May 1992, I joined Technology Research and Investigations (Environmental Sciences), Eskom, Rosherville/Johannesburg.** My responsibilities included meteorological investigations for siting of nuclear and coal fired power stations; research on large-scale recirculation of pollutants in South Africa; national monitoring network for acid deposition; key participant of SAFARI’92 project (Southern African Fire-Atmosphere Research Initiative) which was an international collaborative project and together with TRACE-A falls under the umbrella of STARE which itself is part of the IGAC (International Global Atmospheric Chemistry) project and IGBP (International Geo-sphere-Biosphere Programme); airborne pollution sampling; transboundary transport of pollutants; dispersion modelling and drought cycles risk analysis; key participant and Steering Committee member of the international co-operative SAFARI 2000 project (Southern African Land-Atmosphere-Biosphere Interactions). Furthermore, I was nominated as Scientific Advisor for Eskom’s *Global and Regional Climate Change Portfolio* and member of numerous Steering Committees of the Water Research Commission (National Research Projects).

**In April 2000 began the next chapter, when I moved to Brazil to take on a research position as radar meteorologist at the Instituto de Pesquisas Meteorológicas (IPMet), Universidade Estadual Paulista (UNESP) in Bauru, in the geographic center of the State of**

São Paulo. The principal objectives were: to analyze Doppler radar data from the two S-band radars, located in Bauru and the west of the state in order to identify signatures, which would be suitable for early identification of severe storms and Nowcasting. Activities also included advice for preparing project proposals for SIHESP (Sistema Integrado de Hidrometeorologia do Estado de São Paulo), as well as international networking, presentation of Project Proposals to FAPESP (a Funding organization similar to NRF) and presentations at National & International Conferences. Soon I began to integrate the Doppler radar data with lightning observations, synoptic weather studies, satellite observations & Meso-scale model forecasts. Furthermore, I was the Brazilian Coordinator for several international collaborative Projects: TROCCINOX (Tropical Convection, Cirrus, and Nitrogen Oxides) Experiment led by the German DLR - a European Community project with field campaigns in Jan/Feb/Mar 2004 & 2005; HIBISCUS Project - a European Community project of the French CNRS & CNES with a field campaign in Jan/Feb/March 2004 to launch stratospheric balloons; General Coordinator of TroCCiBras (Tropical Convection and Cirrus Experiment Brazil) with a joint field campaign with TROCCINOX and HIBISCUS during Jan/Feb/Mar 2004; TRO-Pico Project (multiscale water budget in the upper troposphere and lower stratosphere in the tropics, with balloons launched from Bauru) - a joint project of CNRS & IPMet, with major field campaigns in Jan/Feb 2012 & 2013, funded by the French Agence Nationale de la Recherche (ANR).

**Administrative responsibilities at IPMet:** 4-year terms each as “Research Coordinator”, “Coordinator of Operations” and “Coordinator of Informatics”. Advisor for undergraduate (BScHons) geography & meteorology students; External examiner of numerous MSc & PhD thesis (in Brazil & South Africa); referee for 10+ international Journal.

**On 06 March 2014**, having reached 70 years of age, **I had to retire from UNESP**, but work with BSc(Hons) students and contract projects continued until 2016; further publications are still in preparation - research never ends ....!

## **SUMMARY OF PUBLICATIONS**

63 papers in refereed Journals (author/co-author)  
5 book chapters  
233 papers in proceedings of International and National Conferences (author/co-author)  
145 research, technical or contract reports

Principal Editor "Air Pollution and its Impacts on the South African Highveld", ESA

**A detailed CV, complete list of Projects and Publications are available at:**

<http://lattes.cnpq.br/0722917897677961> (click on “English”)

## **SASAS ACTIVITIES:**

Council Member since the foundation of SASAS in 1983

Member of Executive Committee and Treasurer, 1984-1991

President from October 1998 to October 2000 (Presidential Address delivered on my behalf by Estelle de Coning - copy of PPT available on request)

Organization of most Conferences until 1991

Member of the Organizing Committee of 5<sup>th</sup> Intern. Conference on SHMO, Pretoria, 1997

Invited reviewer and judge for the Stanley Jackson Award; annually from 2003 to 2008 ?

Member of several National Advisory Committees and Technical Working Groups

South African Council for Natural Scientific Professions:

Registered Natural Scientist 1983 - 2016 (Reg.No. 401639/83)

**That's what I can remember about the early time and founding of SASAS:**

**Symposium on Thunderstorm and Related Research, 25-26 Sept 1980**

Organized & sponsored by NPRL

**Symposium on Atmospheric Sciences (18-20 Oct 1983)**

Organized & sponsored by NPRL in collaboration with SIRI & SAWB

Organizing Committee: Chairmen Dr A E Carte

Founding of SASAS was constituted DURING or AFTER the above Symposium !

I only remember that Dr A E Carte was elected President; I think Dr Danie vdS Roos was Secretary (?); further possible participants: Dr Johann Lutjeharms (?); Dr Louis du Pisani (?); SAWB (??).

**First SASAS Conference in 1984** (only invited presentations of review papers);

First President: Dr A E Carte

**Second Annual SASAS Conference in 1985** (11-12 November 1985)