Curriculum Vitae

Name:	Detlef Müller
Date of Birth:	19 October 1965
Place of Birth:	Hirschau
Country:	Germany

Current Full Time Employer:
Wuhan University
Wuhan, China
Phone +86 2 73 71 49 10 19
E-mail dgmueller@whu.edu.cn

Education

University (1987 - 1993)

- April 1987 – July 1990: University Regensburg
  Program of study: Physics; Diplom (German University Diploma)
- August 1990 – July 1991: University of Colorado at Boulder, Colorado, USA
- August 1991 – November 1993: University Regensburg

July 1985 – September 1986

Military service in Neunburg v.W., Germany

School: 1972 - 1985

- September 1972 – July 1976: Elementary school, Hirschau, Germany
- September 1976 – June 1985: Gregor-Mendel Gymnasium, Amberg, Germany
- June 1985: Abitur (German university entrance diploma)

Qualifications

German Habilitation degree (= professorial dissertation including postdoctoral lecture qualification in meteorology) in March 2007;

- Habilitation thesis carried out at the Leibniz Institute for Tropospheric Research, Leipzig, Germany
- Title: "Dr. rer. nat. habil." awarded by the faculty of Physics and Earth Sciences at the University Leipzig, Leipzig, Germany
  - Supervisor: Prof. J. Heintzenberg, Leibniz Institute for Tropospheric Research, Leipzig, Germany
  - Appraiser 1: Prof. R. Hoff, University of Maryland, College Park, MD, USA
  - Appraiser 2: Prof. T. Murayama, Tokyo University of Marine Science and Technology, Tokyo, Japan
- Title of habilitation thesis (written in English):
  Characterization of free-tropospheric particles with multiwavelength Raman lidar: Geometrical, optical, and microphysical properties of aerosol pollution from Europe, North Africa, South Asia, and North America

PhD: Dr. rer. nat. (in meteorology) in December 1997

- PhD thesis carried out at the Leibniz Institute for Tropospheric Research, Leipzig, Germany
- Title: "Dr. rer. nat." awarded by the faculty of Physics and Earth Sciences at the University Leipzig, Leipzig, Germany
- Referees:
  - Supervisor: PD Dr. habil. A. Ansmann, head of lidar group at the Leibniz Institute for Tropospheric Research, Leipzig, Germany
  - Appraiser 1: Prof. J. Heintzenberg, Professor at the Institute for Meteorology of the University Leipzig and director of the Leibniz Institute for Tropospheric Research, Leipzig, Germany
  - Appraiser 2: Prof. H. Grassl, Professor at the Institute for Meteorology of the University Hamburg and director of the Max Planck Institute for Meteorology in Hamburg, Germany
- Title of PhD thesis (written in German):
  Bestimmung der mittleren Größe atmosphärischer Aerosolpartikel aus kombinierten Raman-, Mehrwellenlängen-, und Polarisationslidarmessungen
  (Determination of mean size of atmospheric aerosol particles from combined measurements with Raman-, multiwavelength-, and polarization lidar)

Universitätsdiplom (German university diploma in physics) in November 1993;
various topics of experimental theoretical, and applied physics, 3 years of mathematics and 1 year in chemistry). Diploma thesis carried out at the chair for applied laser physics at the University Regensburg, Regensburg, Germany

- Supervisor: Prof. Max Maier (department chair; laser specialist)
- Appraiser: Prof. Wilhelm Prettl (professor in field of solid state physics)
- Title of diploma thesis (written in German):
  Laserspektroskopische Untersuchungen von Sauerstoff-Molekülen
  (Laser spectroscopic investigations of oxygen molecules)

Employment history

- **Since 1 September**
  Professor (fulltime), Yangtze River scholar at School of Remote Sensing and Information Engineering, Wuhan University, China
- **November 2014 – December 2021 (part-time since 1 Jan 2022)**
  Professor (tenured), School of Physics, Astronomy, and Mathematics, University of Hertfordshire, United Kingdom
- **January 2019 – August 2021 (part-time since 1 Sep 2021)**
  AERSENSE LTD, Limassol, Cyprus
- **July 2013 – July 2019**
  Director of Remote Sensing Consultants, LTD., Potters Bar, United Kingdom
- **May 2012 – April 2020**
  Adjunct Professor at Gwangju Institute of Science and Technology (GIST)
- **February 2013 – October 2014**
  Reader (comparable to level of Associate Professor in US), School of Physics, Astronomy, and Mathematics, University of Hertfordshire, United Kingdom
- **April 2012 – October 2018 (end of project):**
  Chief Research Science Advisor in support of the NASA Langley Research Center Science Directorate, Hampton, Virginia, USA; project carried out under O-1 visa status (special abilities and skills)
- **March 2012, South Korea**
  Professor (Research) at the Atmospheric Remote Sensing Laboratory, School of Environmental Science and Engineering (SESE), Gwangju Institute of Science and Technology (GIST)
- **October 2008 – February 2012, South Korea (end of project)**
  Professor (Associate) at the Atmospheric Remote Sensing Laboratory, Department of Environmental Science and Engineering (DESE), Gwangju Institute of Science and Technology (GIST)
- **April 1994 – September 2008, Germany**
  Research scientist at the Leibniz Institute for Tropospheric Research in the research group *Optical Remote Measurements (Lidar)*
- **November 1992 – February 1994, Germany**
  Research scientist at the chair for applied laser physics at the University Regensburg. Organization of laboratory courses and lectures for students majoring in chemistry, biology, medicine and physics

Work in committees, advisory group, invited specialist (selection only):

- Expert Reviewer for European Commission since 2019
- Expert Reviewer for Marie Skłodowska-Curie Action Individual Fellowships 2019
- Committee member (review board): Royal Society “International Newton Fellowships” since 2016

- Committee member in program “RESTART”, coordinated by main research funding body in Cyprus since 2017

Awards and Grants

- Changjiang (Yangtze River) Scholar award (长江学者奖励计划) since 2021
- Grant from Marie-Skłodowska-Curie Action Fellowship of the European Commission: CAPABLE (Chemical Composition characterization of air pollution (aerosols and gases) on the basis of nonlinear multi-channel lidar experiments), 2017 – 2019;
- Royal Society Wolfson Research Merit Award, United Kingdom, 2013 – 2018;
- NASA Langley Group Achievement Award for work on the DISCOVER-AQ Science Team, 2015;
- NASA Langley Research Center Group Achievement Award for the development of lidar technologies, 2013;
- Grant from the Spanish Ministry of Education and Science for student teaching at the University of Granada, Spain, 2011;
- Grant from Marie Curie Program for Romania, European Commission, 2011;
- Co-author on paper awarded with Inaba Prize (highest ILRC award): *Raman spectra of chemical components of atmospheric aerosols obtained by multi-channel lidar spectrometer,* by Tatarov, B., N. Sugimoto, I. Matsui, D. H. Shin and D. Müller. Presented at the 25th International Laser Radar Conference (ILRC), 5 - 9 July, St. Petersburg, Russia, 2010;
- Grant from the Spanish Ministry of Education and Science for student teaching at the University of Granada, Spain: 2010, 2009, 2008;
- JSPS Fellowship for Research in Japan, Japan, 2006;
- Research grant of the National Center for Atmospheric Research, USA, 2004;
- Grant from the Centre National de la Recherche Scientifique, France, 2003.

Commercialization, patents

- Software package TiARA for retrieval of aerosol microphysical and optical properties (light-absorption) from active remote sensing instrument (LIDAR) and combination of LIDAR with passive remote sensors.
- Development of software for assessing amount of particulate emissions (mainly dust) in stack plumes; software developed for one of the world-leading companies that develop and sell instruments for monitoring of emissions from, e.g. industrial stacks
- Ocean Color Correction scheme developed in cooperation with SME Brockmann Consult, Germany for European Space Agency.

Research (key areas)

- Aerosol studies (optics, microphysics, radiative impact) with optical remote measurement and remote sensing methods: lidar, sun photometer, star photometer (measurements, data analysis, and scientific interpretation), satellites
- Development of aerosol models for radiative impact studies of aerosl pollution, satellite atmospheric correction schemes (aerosol pollution), ocean color retrieval schemes, use of lidar for development of models for use in risk assessment and impact studies (human health, agriculture, air safety)
- Development of lidar instrument techniques and laser-measurement techniques:
    - Identification of mineral dust and bio-aerosols (as key topic in new laboratory)

    - Spectroscopic methods for application in Raman, High-Spectral Resolution and Fluorescence lidar: identification of chemical signatures in aerosol pollution (man-made and natural) and bio-aerosols
    - Applications of lidar technologies and optical detection methods in life sciences, e.g. agriculture, human health, air quality
- Development and application of mathematical methods (inversion algorithms): determination of aerosol parameters relevant for studies on changes of climate and the environment and impact on human health and society
- Synthesis of aerosol observations carried out with ground-based and space-borne active and passive remote sensors (for example NASA CALIPSO, NASA A-Train, ESA Aeolus and future space missions)
- Electro-magnetic light-scattering theory
- Applications of neural networks and „big-data" processing methods

Funding collected in total for my research work since 2001 (in alphabetical order of currency name):
EUR: ~ 580,000.00
GBP: ~ 1,800,000.00
KRW: ~ 770,000,000.00
RMB: ~ 3,000,000
USD: ~ 720,000.00

SCOPUS – 1 Apr 2022:
178 publications in international double peer-reviewed journals/conference proceedings; 461 co-authors; 8579 citations;
H-factor: 55 in total; 49 with self-citations excluded;
Most contributed Topics 2016–2020 (exampples only): AERONET; aerosol; aerosol property; particle size distribution; lidar; source apportionment; air quality; CALIOP

Year	Number (total)	Number (first author)	Number (as co-author with own research team)	Number (as co-author with external research team)	Journals
1998	1	1	-	-	AO
1999	2	2	-	-	AO
2000	4	2	2	-	AO, JGR, GRL, JAOT
2001	6	3	3	-	AO, JGR, GRL
2002	9	1	4	4	AO, AR, JGR, GRL
2003	6	2	3	1	GRL, JGR, T
2004	4	1	1	2	AO, GRL, JGR
2005	7	1	2	4	AO, GRL, JGR, JOSA-A
2006	6	1	-	5	AO, GRL, JGR
2007	4	2	1	1	AO, JGR
2008	9	-	5	4	AE, AO, JGR, JAOT
2009	23	3	10	10	AE, AO, GRL, JAOT, JGR, T
2010	10	3	6	1	GRL, JGR, T

2011	12	1	2	9	AO, GRL, JGR, OE, QJRMS, T
2012	11	2	3	6	AO, AMT, AME, APC, EC, PM, GRL, JGR
2013	6	-	3	3	AO, ACP, JAS, JGR
2014	6	1	4	1	AAS, AMT, AO, JGR
2015	1	-	1	-	ACP
2016	15	1	11	3	ACP, AE, AMT, AO, C, IJRS
2017	4	-	3	1	ACP, AE
2018	4	-	3	1	AMT, AO, JAS
2019	5	1	3	1	AO, AMT, ACP, AO
2020	1	0	0	1	ACP, AMT, AO
2021	2	0	1	1	AMT, OL
2022	1	0	0	1	ACP (submitted)

Abbrevation **= Journal (selection from 31 journals)**

AAS = Atmospheric Aerosol Science
ACP = Atmospheric Chemistry and Physics
AE = Atmospheric Environment
AM = Advances in Meteorology
AMT = Atmospheric Measurements Techniques
AO = Applied Optics;
AR = Atmospheric Research
C = Chemosphere
GRL = Geophysical Research Letters
IJRS = International Journal of Remote Sensing
JAOT = Journal of Atmospheric and Oceanic Technology
JAS = Journal of Atmospheric Science
JGR = Journal of Geophysical Research
JOSA-A = Journal of the Optical Society of America – A
OE = Optics Express
QJRME = Quarterly Journal of the Royal Meteorological Society
T = Tellus-B

The following table shows an overview of my other contributions. I do not distinguish among the years of publication.

	Number (total)	**Number (first author)**	**Number as co-author of own research team**	**Number as co-author with external research team**
PhD thesis, 1997	1	1	-	-
Professorial dissertation, 2007	1	1	-	-
Book chapter	4	3	1	-
Conference proceedings, reports	203	50	94	59
Seminar talks	45	45	n/a	n/a
Key note speeches	4			

Participation in field campaigns and measurement networks

- European Aerosol Research Lidar Network (EARLINET):
    - fourth phase, ACTRIS-2/EARLINET: 2015 – 2019 (https://www.actris.eu)
- European Aerosol Research Lidar Network (EARLINET):
    - third phase, ACTRIS/EARLINET: 2011 - 2015
- Absorbing aerosol layers in a changing climate: aging, lifetime and dynamics (A-LIFE), Cyprus, April 2017 (https://www.a-life.at/)
- PRE-TECT, Crete, Greece, April 2017 (http://pre-tect.space.noa.gr/)
- Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality (DISCOVER-AQ); Boulder, CO, USA, Jul/Aug 2014 (https://discover-aq.larc.nasa.gov/)
- Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality (DISCOVER-AQ); Houston, TX, USA, Jan/Feb 2013
- Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality (DISCOVER-AQ); Palmdale, CA, USA, Jan/Feb 2013
- Two-Column Aerosol Project (TCAP); Cape Cod, MA, USA, July 2012 (https://www.arm.gov/research/campaigns/amf2012tcap)
- European Aerosol Research Lidar Network (EARLINET):
    - second phase, EARLINET – ASOS: 2006 – 2011
- Saharan Mineral Dust Experiment (SAMUM) 2008; Republic of the Cape Verde, January/February 2008; organisation of logistics of ground-based activities (40 scientists) (https://books.google.co.uk/books?id=1jBnBAAAQBAJ&pg=PA277&lpg=PA277&dq=samum+cape+verde&source=bl&ots=Qm0LCzwN5o&sig=MJQLqLnRbTUXxhaqsXvK4viyoUY&hl=en&sa=X&ved=2ahUKEwikuZHc6OLbAhWhDsAKHVCSD-c4ChDoATACegQIARA3#v=onepage&q=samum%20cape%20verde&f=false)
- Convection and Orographically-induced Precipitation Study (COPS); southwest Germany, June - August 2007
- Saharan Mineral Dust Experiment (SAMUM) 2006; Morocco, May/June 2006; organisation of logistics of all ground-based activities (more than 40 scientists) (https://onlinelibrary.wiley.com/doi/full/10.1111/j.1600-0889.2008.00403.x)
- International Lindenberg Campaign for Assessment of Humidity- and Cloud-Profiling Systems and its Impact on High-Resolution Modelling (LAUNCH); Germany, August – October 2005
- European Aerosol Research Lidar Network (EARLINET):
    - first phase, EARLINET: 2000 - 2003
- Indian Ocean Experiment (INDOEX); Indian Ocean/Maldives, January 1999 – March 2000 (https://en.wikipedia.org/wiki/Indian_Ocean_Experiment)
- AFS – German Lidar Network; 1997 – 2000
- Lindenberg Aerosol Characterization Experiment (LACE) 98; Lindenberg/Germany; July/August 1998

- Second Aerosol Characterization Experiment (ACE 2); North Atlantic/Portugal, June/July 1997 (https://www.tandfonline.com/doi/abs/10.3402/tellusb.v52i2.16088)
- Lindenberg Experiment (LINEX) 1996; Lindenberg/Germany, September 1996

Co-operations with institutes and organisations (selection only)

Europe:

– Laboratoire d'Optique Atmospherique, CNRS Universite de Lille, Villeneuve d'Ascq, France ;
– Leibniz Institute for Tropospheric Research, Leipzig, Germany;
– Physics Department, National Technical University of Athens, Athens, Greece;
– Istituto di Metodologie per l'Analisi Ambientale I.M.A.A. - C.N.R., Potenza, Italy;
– Center for Applied Physics and Environment, University of Granada, Spain;
- Physics Instrumentation Center, Troitsk, Moscow Region, Russia;

North America:

- NASA Langley Research Center, Hampton, VA;

Asia:

- Kyungpook National University, Busan, South Korea;

Research/training of researchers and students at institutes/universities in USA, and various countries in Europe and East Asia

Teaching expertise since 2005:

I have been working in the field of experimental atmospheric physics, remote sensing and meteorology for nearly 25 years. Lectures and seminars in these areas as well as classical (general) physics are an integral part of my teaching and training of students and research scientists. I support students in knowledge transfer related to research in industry.

Lecture at Wuhan University (from Sep 2022)

- **Title: Introduction to Radiative Transfer in the Atmosphere and Application to Remote Sensing**
  Semester A 2022/2023

Lectures at the University of Hertfordshire (2013 to 2021; selection only)

– Title: 7PAM1022 “Atmospheric Physics”, 15 credit hours;
  Description: Introduction to the fundamental processes in the atmosphere, meteorology and climate;
  Semester B 2017/2018 (module leader), module cancelled in Semester B 2016/2017;
  Semester B 2015/2016 (module leader); Semester B 2014/2015 (module leader);

- Title: 7PAM1028 “Physics Research Project”, 60 credit hours;
  Description: Supervision of students engaged in physics- and atmospheric-physics-related research projects;
  Semester A/B 2017/2018; Semester A/B 2015/016; Semester A/B 2014/2015;

– Title: 4PAM1070 “Computational Modelling”, 15 credit hours;
  Description: Introduction to programming in Python;

Semester B 2020/2021;

- Title: 4PAM0023 “Applications of Computing”, 15 credit hours;
  Description: Introduction to programming in Matlab;
  Semester B 2017/2018 (module leader); Semester B 2016/2017; Semester B 2015/2016; Semester B 2014/2015 (module leader); Semester B 2013/2014 (module leader); Semester B 2012/2013;

- Title: 4PAM1007 “Engineering Mathematics”, 15 credit hours;
- Description: Introduction to mathematics for engineers, programming in MATLAB and tutoring of lecture material;
  Semester B 2020/2021; Semester B 2017/2018 (module leader); Semester B 2016/2017;

- Title: 4PAM1027“Small Group Tutorial”, 0 credit hours (pass required by attendance);
  Description: Tutorials in physics and mathematics related problems;
  Semester A/B 2018/2017; Semester A/B 2016/2017; Semester A/B 2015/2016; Semester A/B 2014/2015; Semester A/B 2013/2014;

- Title: 5PAM1005 “Further Engineering Mathematics”, 15 credit hours
  Description: Tutorials and lectures in mathematical topics for engineer students;
  Semester A 2020/2021; Semester A 2019/2020;

- 6PAM1027 “Further Numerical Methods”, 15 credit hours
  Description: Programming (in python) of mathematical problems that involve approximation methods;
  Semester B 2020/2021;

- Title: 6PAM0026 “Project - Physics”; 30 credit hours;
  Description: Physics-related projects of 3rd year undergraduate students;
  Semester A/B 2020/2021; Semester A/B 2017/2018; Semester A/B 2016/2017; Semester A/B 2015/2016; Semester A/B 2014/2015; Semester A/B 2013/2014;

- Title: 6PAM0026 “Project – Astrophysics”; 30 credit hours;
  Description: Physics-related projects of 3rd year undergraduate students;
  Semester A/B 2020/2021; Semester A/B 2017/2018; Semester A/B 2016/2017; Semester A/B 2015/2016; Semester A/B 2014/2015; Semester A/B 2013/2014;

- Title: 6PAM1004 “Computational Physics”, 15 credit hours;
  Description: Advanced scientific programming in Matlab and problem solving in physical applications;
  Semester A 2015/2016 (module leader); Semester A 2014/2015 (module leader); Semester 2013/2014 (module leader);

- Title: 6PAM1060 “Applied Optics and Photonics”
  Description: Advanced module about modern applications of optics in the photonic industry and research;
  Semester A 2020/2021; Semester A 2019/2020;

- Title: 6PAM2003 “Photonics”
  Description: Advanced module about theory and application of laser physics, optical elements and detectors in the photonic industry and research;

Semester A 2021/2022

- Title: 7PAM "Atmospheric Physics"
  Description: Introduction to atmospheric physics, meteorology, and remote sensing techniques for students in MPhys programme
  Semester B 2017/2018 (module leader); Semester B 2016/2017 (module leader); Semester B 2015/2016 (module leader);

- Title: 7PAM "Nature of the Climate System"
  Description: Introduction to atmospheric physics, meteorology, climate modelling, observation techniques in studies of climate change for students in MPhy programme;
  Semester B 2020/2021;

Moderator work at University of Hertfordshire (support in course development)
Various courses

Lectures at GIST, South Korea (2009 – 2011)
- Title: „Remote Sensing of Aerosols, 2", 3 hours per week;
  Description: Application of remote sensing techniques in aerosol research; satellite sensor techniques, lidar, radar, radiometers; DOAS;
  Spring term 2011;

- Title: „Remote Sensing of Aerosols, 1", 3 hours per week;
  Description: Overview on remote sensing techniques; introduction to the fundamentals of radiative transfer in the atmosphere; light-scattering theory, electromagnetic theory;
  Fall term 2010;

- Title: „Introduction to Meteorology" 3 hours per week;
  Description: Introduction to the basics of meteorology (concepts, theory, experiment);
  Spring term 2010, fall term 2011;

- Title: „Environmental Meteorology", 3 hours per week;
  Description: Introduction to meteorology; introduction to micrometeorology; introduction to measurement techniques of meteorological state parameters, aerosol, and gases; overview on cloud physics;
  Spring term 2009;

- Title: „Remote sensing of Aerosols", 3 hours per week;
  Description: Overview on remote sensing techniques; introduction to the fundamentals of radiative transfer in the atmosphere; basic satellite sensor techniques, lidar, radar, sun photometer; theoretical concepts and applications;
  Fall term 2008, fall term 2009;

Lecture for students in master course (geophysics and meteorology) at the Department of Applied Physics at the University Granada (Spain)
- Title: "Aerosol Lidar and Inversion Methods";
  Summer semester 2011, block course in April;
- Title: "Atmospheric Parameters Measured with Lidar, Inversion Theory and Applications";
  Summer semester 2010; block course in June;
- Title: "Remote Sensing Techniques and Data Analysis";

Summer semester 2009; block course in April/May;
- Title: “Atmospheric Parameters Measured with Lidar”;
  Summer semester 2009; block course in April/May;
- Title: “Inversion Theory”;
  Summer semester 2008; block course in April;
- Title: “Atmospheric Parameters Measured with Lidar”;
  Summer semester 2008; block course in April;

The following topics in physics and atmospheric sciences are covered in my lectures (including tutorials and laboratory courses) in the UK/Germany/South Korea:

- Introduction to meteorology
- Atmospheric radiation
- Atmospheric thermodynamics
- Atmospheric optics (and laboratory courses)
- Physical measurement techniques (and laboratory courses)
- Remote sensing (measurement techniques, basic physical principles, mathematical methods)
- Theory of electromagnetic scattering
- Aerosols and clouds
- Aerosol in-situ measurement instruments
- Optics
- Molecular spectroscopy
- Atom- and molecule physics
- Thermodynamics
- Crystallography
- Software programming

Supervisor/co-supervisor/advisory-board member

University of Hertfordshire, Gwangju Institute of Science and Technology (GIST), Gwangju, South Korea: 6 PhD students, 6 master students
Supervisor, external for Universities in Spain, US

Training courses in the framework of research projects and student teaching

- October 2013 - 2015: Teaching of PhD student and PostDocs in the ITaRS (Initial Training for atmospheric Remote Sensing) program during summer schools held in different European countries. ITaRS is a Marie Curie sponsored program;
- Since 2006: teaching and training courses in data inversion methodologies for PhD students and post docs in the framework of EARLINET and other co-operations (Cyprus, Germany, Greece, Italy, Japan, Portugal, Republic of Korea, Romania, Spain, USA);

Review activities for

1) Journals

- Advances in Meteorology
- Annales Geophysicae
- Applied Optics
- Atmosfera
- Atmospheric Chemistry and Physics

- Atmospheric Environment
- Atmospheric Measurement Technologies
- Atmospheric Research
- Geophysical Research Letters
- Journal of Applied Remote Sensing
- Journal of Atmospheric and Ocean Technology
- Journal of Atmospheric and Solar-Terrestrial Physics
- Journal of Atmospheric Chemistry
- Journal of Geophysical Research
- Journal of the Optical Society of America – A
- Optics Letters
- Optics Express
- Quarterly Journal of the Royal Meteorological Society
- Science of the Total Environment
- IEEE Transactions on Geoscience and Remote Sensing
- Tellus
- Water, Air & Soil Pollution

2) Funding organizations

- Global Research Network program (CATER), Republic of Korea
- National Science Foundation of Korea, Republic of Korea
- National Aeronautics and Space Administration (NASA), USA
- National Oceanic and Atmospheric Administration (NOAA), USA
- National Center for Atmospheric Research (NCAR), USA
- National Environmental Research Council, UK

3) **Conferences**

- Asia Oceania Geosciences Society, 2012;
- SPIE Remote Sensing 2012;
- IEEE International Geoscience and Remote Sensing Symposium 2018, 2017, 2016 2015, 2014, 2013, 2012, 2011;
- Asian Aerosol Conference 2005;
- International Symposium on Advanced Environmental Monitoring 2004, 2006
- International Symposium on Tropospheric Profiling 2003, 2006
- European Aerosol Conference 2001, 2008;
- International Laser Radar Conference (ILRC) 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2015, 2017;

Extra-curricular activities

- Westminster, UK Parliament: visits to civil servants offices (policy-making), 2016;
- Interviews on television and radio stations, and in newspapers in Germany, South Korea, and UK;
- presentations on global climate change and air pollution in Korea and Southeast Asia (High Schools, Universities); Organization of High School Student Olympiad at GIST;
- press releases in the UK, Germany and South Korea;

Memberships

- German Physical Society (Deutsche Physikalische Gesellschaft)
- Advisory board of NASA project “Airborne multiwavelength high-spectral-resolution Raman lidar”, NASA Langley Research Center, VA, USA, 2012 to 2018;