GRASP-ACE SUMMER SCHOOL
27 – 31 May 2019, Granada

Mon, 27 May	Tue, 28 May	Wed, 29 May	Thu, 30 May	Fri, 31 May
9:00 – 10:00 Registration 10:00 – 10:30 Introduction *Lucas Alados-Arboledas, UGR* 10:30 – 11:00 GRASP software overview David Fuertes, GRASP SAS	9:00 – 10:00 GRASP scientific concept overview *Oleg Dubovik, CNRS* 10:00 – 10:30 Ground-based networks *Benjamin Torres, University of Lille* 10:30– 11:00 SPARTAN network overview *Richard Kleidman, AirPhoton LLC*	9:00 – 10:00 Inversion of lidar measurements to particle properties *Igor Veselovskii, Prokhorov General Physics Institute* 10:00 – 11:00 GRASP/GARRLiC: retrievals of aerosol vertical distribution *Anton Lopatin, GRASP SAS*	9:00 – 9:30 Radiative transfer in the atmosphere *Pavel Litvinov, GRASP SAS* 9:30 – 10:30 Principles of statistical estimation in remote sensing inversion *Oleg Dubovik, CNRS* 10:30 – 11:00 Introduction to the NASA aerosol products *Richard Kleidman, AirPhoton LLC*	9:00 – 9:30 Utilization of a priori constraints in GRASP *Oleg Dubovik, CNRS* 9:30 – 10:00 GRASP for POLDER/PARASOL mission: products, validation *Pavel Litvinov, GRASP SAS* 10:00 – 12:30 Hands-On
Coffee Break 11:00 – 11:30	Coffee Break 11:00 – 11:30	Coffee Break 11:00 – 11:30	Coffee Break 11:00 – 11:30	Synergy in GRASP: - GRASP- inversion of multi-instrument space observation - GRASP- synergy of ground-based and satellite observations
11:30 – 12:30 From AERONET to GRASP: Evolution, verification, and importance *Gregory Schuster, NASA Langley*	11:30 – 12:00 Modeling and remote sensing of inhomogeneous aerosols *Yevgeny Derimian, University of Lille* 12:00 – 12:30 Modelling of aerosol scattering in GRASP application *Oleg Dubovik, CNRS*	11:30 – 12:30 Modelling gaseous absorption in atmosphere *Jürgen Fisher, Free University of Berlin*	11:30 – 12:30 Hands-On NASA MODIS and NOAA VIIRS products *Richard Kleidman, AirPhoton LLC*	
Lunch 12:30 – 14:00	Lunch 12:30 – 14:00	Lunch 12:30 – 14:00	Lunch 12:30 – 14:00	Lunch 12:30 – 14:00
14:00 – 17:30 Hands-On GRASP structure and functionalities: - GRASP installation - GRASP configuration - intro to GRASP-cloud - Running first example: understanding input/settings/output	14:00 – 17:30 Hands-On GRASP general functionality, application to ground-based instruments – part 1: - GRASP-phase function (nephelometers) - GRASP- AOD - GRASP-ground-based radiometer- Error estimates	14:00 – 17:30 Hands-On GRASP for ground-based instruments - part 2: - GRASP- ground-based lidar - GRASP- ground-based radiometer+lidar - Spheroid package and aerosol scattering in GRASP	14:00 – 17:30 Hands-On GRASP for satellite retrievals, radiative transfer and surface modelling: - Radiative Transfer in GRASP - Surface reflection modeling in GRASP - GRASP- space and airborne radiometers - GRASP- ground-based and space-borne lidars	14:00 – 15:30 Hands-On continuation 15:30 – 16:30 Conclusion 16:30 – 17:30 Questions and feedback 17:30 Adjourn
20:00 – 22:00 Tapas bars discovery	19:00 – 20:30 Visit to the Royal Hospital, headquarters of the University of Granada	22:00 – 23:30 Granada Tour and Nighttime Visit to the Alhambra	20:30 – 22:30 Social dinner at 'Maria de la O' restaurant	

All 1-hour lectures include 15 min for questions
Afternoon practice will include short 15 min presentations and coffee breaks
Hands-On support team: Fabrice Ducos, Benjamin Torres, Tatsiana Lapionak, Milagros Herrera (University of Lille); David Fuertes, Anton Lopatin, Pavel Litvinov (GRASP SAS) and Christoph Holter (Catalysts GmbH)