



Program of the HEMERA summer school in Heidelberg/Germany, Sept. 9 -13, 2019

The HEMERA summer school

held at the Marsilius Kolleg* in Heidelberg/Germany from Sept. 9 to 13, 2019

(address: Im Neuenheim Feld (INF 130.1) Campus at Heidelberg, D-69120 Heidelberg, Germany)

Program:

Monday, Sept. 9, 2019

9:00 - 9:15 Welcome

K. Pfeilsticker, Summer school organizer and local host, University of Heidelberg, Germany
P. Raizonville, EU-HEMERA project coordinator, CNES, France

9:15 - 10:45, Session: Background 1 (Converner: Nathalie Huret)

1.1 C. Camy-Peyret, The history of ballooning, early science, past advances and discoveries, scientific interest, Institute Pierre Simon Laplace, France
1.2 P. Ubertini, Early and modern balloon science in astronomy, Istituto Nazionale di Astrofisica (INAF), Italy

10:45 - 11:15 Coffee break

11:15 - 12:45, Session 1: Background

1.3 T. Deshler, Early and modern stratospheric science using small and medium sized, unpressurized balloons, Uni. Wyoming, USA
1.4 V. Catoire, Early and modern balloon science using large unpressurized balloons, Le Laboratoire de Physique et de Chimie de l'Environnement et de l'Espace (LPC2E), Centre national de la recherche scientifique (CNRS), France

12:45 - 14:00 Lunch break

14:00 - 14:45, Session 1: Background

1.5 A. Hertzog, Science using long duration balloons, Laboratoire de Météorologie Dynamique (LMD), France

14:45 - 15:30 Session 2: Atmosphere (Convener Pietro Ubertini)

2.1 T. Birner, The atmospheric structure, Ludwig-Maximilians-Universität München (LMU), Munich, Germany

15:30 - 16:00 Coffee break

16:00 – 17:30 Session 2: Atmosphere

2.2 N. Huret, Atmospheric dynamics I, Centre national de la recherche scientifique (CNRS) France
2.3 A. Hertzog, Lagrangian observations, waves, microphysics, Laboratoire de Météorologie Dynamique (LMD), France



Tuesday, Sept. 10, 2019

9:00 – 9:45, Session 2: Atmosphere

2.4 A. Butz, Atmospheric radiation and radiative transfer, University of Heidelberg, Germany

09:45 - 10:30, Session 3: Balloon system (Converner: Philippe Raizonville)

3.1 K. Andersson&K. Garg, Flight physics & thermodynamics, Swedish Space Corporation (SSC), Sweden

10:30 - 11:00 Coffee break

11:00 - 12:30, Session 3: Balloon system

3.2 S. Venel (substituted by A. Vargas), The different balloon families and associated performances, Centre national d'études spatiales (CNES), France

3.3 H. Eriksson, Balloon components: equipped envelope; flight-train, on board/ground system and scientific payloads, Swedish Space Corporation (SSC), Sweden

12:30 - 14:00 Lunch break

14:00 - 15:30, Session 3: Balloon system

3.4 I. Zenone, On-board services: platform structure, telemetry & tracking & remote control (TT & C), power supply, thermal control and pointing system, Centre national d'études spatiales (CNES), France

3.5 K. Walker, Design of a laser spectrometer for in-situ balloon measurements, University of Toronto, Canada

15:30 - 16:00 Coffee break

16:00 - 17:30, Session 3: Balloon system

3.6 Design of scientific instruments remotely by VC

- B. Netterfield, Design of a balloon-borne imaging telescope for stratospheric balloon missions, University of Toronto, Canada

- P. Loewen, Design and Build of Electronic Systems for High Altitude Balloons, University of Saskatchewan, Canada

Wednesday, Sept. 11, 2019

9:00 - 10:00, Session 3: Balloon system

3.7 H. Eriksson, Safety requirements: mechanical & electrical design of gondola and flight train, redundancy of house-keeping system, constraints on balloon facility location and on balloon trajectories, Swedish Space Corporation (SSC), Sweden

3.8 A. Vargas, Examples of Fail Safe CNES TT&C system for balloon flight control, Centre national d'études spatiales (CNES), France



10:30 - 11:00 Coffee break

11:00 - 12:30, Session 4: Balloon operations (Convener: A. Vargas)

4.1 A. Vargas, Site selection, launching methods; flight control; trajectory management and recovery, Centre national d'études spatiales (CNES), France

12:40 – 12:45 Group photo in front of the Marsilius college

12:45 - 14:00 Lunch break

14:00 -18:00

Social activities/Options

- I. Start at 15:00 at the Bergbahn funicular station, followed by the visit of the Heidelberg castle with guided 'Höhepunktführung' tour
- II. 15:00 Solar boat trip on the Neckar river (check-in 14:45 at the pier next to the old bridge), followed by a guided tour through part of the town, scenic stroll with Susanne Späinghaus <http://www.heidelberger-gaestefuehrer.de/index.php?option=content&task=view&id=193> on the Philosophenweg,

20:00 – 23:00

Summer school dinner at the 'Roter Ochsen' (the Red Ox), Rathausstraße 55, HD, see <https://roterochsen.de/en/961-2/>

Dinner choices: 1. Vegetarian, 2. Deer-ragout, and 3. Fish (zander)

Thursday, Sept. 12, 2019

9:00 - 10:30, Session 4: Balloon operations

4.2 H. Eriksson & A. Vargas, Specificity of CNES and SSC operation, Swedish Space Corporation (SSC), Sweden and Centre national d'études spatiales (CNES), France

4.3 A. Vargas & P. Raizonville, Other national balloon programs and associated campaigns: CSBF, NSC, JAXA, etc. Centre national d'études spatiales (CNES), France

10:30 - 11:00 Coffee break

11:00 - 12:30, Session 5: Applications (Aeronomy) (Convener Flora Kluge)

5.1 A. Kleinert et al., Hyperspectral Limb Sounding, Karlsruher Institut für Technologie, Germany

5.2 S. Payan, Balloon-borne mid-IR measurements, Université Pierre and Marie Curie (UPMC), France

5.3 A. Engel, Balloon-borne whole air and AirCore sampling, University of Frankfurt, Germany

12:30 – 13:45 Lunch break

13:45 – 15:45, Session 5: (Light-weight balloon instruments and small balloons)



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5.4 J. E. Leedham-Elvidge, AirCores in the UK: launching balloons on a small and crowded island, University of East Anglia, UK

5.5 T. Deshler, New aerosol instruments to maintain current in situ measurement capability with small rubber balloons, University of Colorado, USA

5.6 N. Harris, Sensors for sondes - how many things can be measured? University of Cranfield, UK

5.7 Sonya Salam, Collection of organic particles in the stratosphere over Esrange/Sweden, Fachhochschule Aachen, Germany

15:45 - 16:15 Coffee break

16:15 – 17:45, Session 5: Applications (astronomy)

5.8 A. Lagg, Sunrise - a stratospheric solar observatory: Scientific highlights of two successful flights & outlook for the re-flight in 2021, Max-Planck-Institut für Sonnensystemforschung (MPS), Germany

5.9 F. Onori, A multi-wavelength view of the transient sky in astronomy, Istituto Nazionale di Astrofisica (INAF), Italy

5.10 M. Pearce, Hard X-ray polarimetry from a stabilised balloon-borne platform, Royal Institute of Technology, Royal Institute of Technology (KTH), Sweden

Friday, Sept. 13, 2019

9:00 - 10:30, Session 6: Outlook, future trends in the balloon systems, instruments and related science (Convener: Emma Elvidge)

6.1 N. Harris, Future developments for balloon observations of the atmosphere - a personal perspective, University of Cranfield, UK

6.2 T. Deshler, Profiling of the tropical tropopause layer with in situ instruments deployed from Strateole2 long duration balloons, University of Colorado, USA

6.3 L. Natalucci, Results from gamma-ray instrument probes on balloon flights and perspectives beyond 2020, Istituto Nazionale di Astrofisica (INAF), Italy

10:30 - 11:00 Coffee break

11:00 - 12:30, Session 6: Outlook, future research opportunities and programs

6.4 P. Raizonville, The HEMERA balloon research infrastructure, Centre national d'études spatiales (CNES), France

6.5 M. Becker, The REXUS/BEXUS program, DLR, Germany

6.7 N. Callens, ESA Academy Programme opportunities, European Space Agency (ESA), Belgium via VC (start 11:40)

6.8 Round table discussion (N. Harris, P. Raizonville, M. Becker, T. Deshler, and R. Roth)

13:00 - 14:00 Lunch&Farwell