

4th Conference of the International Society for Atmospheric Research using Remotely-piloted Aircraft

Monday, 23/May/2016

8:00am - 9:00am	Registration / Poster and exhibit preparation
Hall	
9:00am - 9:20am	Welcome & logistics Director: Marc Pontaud; Chair: Greg Roberts
Amphitheatre	
9:20am - 10:20am	Science applications - Forecasts
Amphitheatre	
	9:20am - 9:40am
	Meteodrones – Towards the perfect 24-hour forecast Martin Fengler, <u>Christian Schluchter</u> Meteomatics GmbH, Switzerland
	9:40am - 10:00am
	Ensemble Sensitivity Analysis for Targeted Observations of Supercell Thunderstorms George Limpert, <u>Adam Houston</u> University of Nebraska-Lincoln, United States of America
	10:00am - 10:20am
	Evaluation of UAS for Infrared Bridge Inspection Using Historic and Predictive Weather Data <u>Suzanne Weaver Smith</u>, Gregorio Robles-Vega University of Kentucky, United States of America
10:20am - 10:40am	Coffee break
Hall	
10:40am - 11:00am	RPA Teaching and Outreach
Amphitheatre	
	10:40am - 11:00am
	Teaching the New Cohort what they don't know they don't know about RPA <u>Philip Stuart Anderson</u> Scottish Association for Marine Science, United Kingdom
11:00am - 12:00pm	Science Applications - Boundary Layer
Amphitheatre	
	11:00am - 11:20am
	Heat fluxes estimated from SUMO profiles during the BLLAST field campaign <u>Line Båserud</u>¹, Joachim Reuder¹, Marius O. Jonassen^{2,1}, Timothy Bonin^{3,4}, Phillip Chilson³, Maria A. Jiménez⁵, Eric Bazile⁶ ¹ Geophysical Institute, University of Bergen, Norway; ² The University Centre in Svalbard, Longyearbyen, Norway; ³ School of Meteorology and Advanced Radar Research Center, University of Oklahoma, OK, USA; ⁴ CIRES/NOAA/ESRL, Boulder, CO, USA; ⁵ Universitat de les Illes Balears, Palma de Mallorca, Spain; ⁶ Meteo-France, Toulouse, France
	11:20am - 11:40am
	Probing the atmospheric boundary layer morning transition with two airborne systems Helipod and MASC <u>Jens Bange</u>, Gerrit Rau, Norman Wildmann University of Tübingen / Germany, Germany
	11:40am - 12:00pm
	Weser15 campaign <u>Burkhard Wrenger</u>¹, Joan Cuxart² ¹ Ostwestfalen-Lippe University of Applied Sciences, Germany; ² University of the Balearic Islands, Palma de Mallorca, Spain
12:00pm - 12:20pm	Poster pico-presentations
Prud'Hommes	
12:20pm - 1:20pm	Lunch Exhibitor preparation as needed
Hall	
1:20pm - 2:20pm	Posters

Prud'Hommes 2:20pm - 2:40pm Amphitheatre	Exhibitor preparation as needed Invited Speaker GHOST - Green House gas Observations of the Stratosphere and Troposphere <u>Andy Vick</u> STFC, United Kingdom
2:40pm - 3:40pm Amphitheatre	Aircraft Control Systems 2:40pm - 3:00pm Fleets of enduring drones to probe atmospheric phenomena with clouds <u>Simon Lacroix</u> ¹ , Greg Roberts ² , Emmanuel Bénard ³ , Murat Bronz ⁴ , Frédéric Burnet ² , Elkhedim Bouhoubeiny ³ , Jean-Philippe Condomines ⁴ , Carsten Doll ⁵ , Gautier Hattenberger ⁴ , Faycal Lamraoui ² , Alessandro Renzaglia ¹ , Christophe Reymann ¹ ¹ LAAS/CNRS, France; ² CNRM/GAME, France; ³ ISAE, France; ⁴ ENAC, France; ⁵ ONERA, France
	3:00pm - 3:20pm A guiding vector field algorithm for path following control of drones <u>Hector Garcia de Marina</u> ¹ , Yuri Kapitanyuk ² , Anton Proskurnikov ² , Ming Cao ² ¹ ENAC, France; ² University of Groningen, Netherlands
	3:20pm - 3:40pm Experimental Wind-Field Estimation Murat Bronz, Jean-Philippe Condomines, <u>Gautier Hattenberger</u> ENAC, France
3:40pm - 4:00pm Hall	Coffee break
4:00pm - 5:00pm Amphitheatre	Aircraft Control Systems 4:00pm - 4:20pm Modelling of sub-cumulus thermal updrafts for autonomous soaring UAVs <u>Martin Tobias Stolle</u> , Yoko Watanabe, Carsten Döll ONERA, France
	4:20pm - 4:40pm Fixedwing UAS soundings of the boundary layer during the ScaleX campaign 2015 in southern Germany <u>Andreas Philipp</u> , Alexander Groos, Erik Petersen University of Augsburg, Germany
	4:40pm - 5:00pm The Unmanned Systems Research Laboratory (USRL) of the Cyprus Institute: Current Status and Perspectives <u>Christos Keleshis</u> ¹ , Marios Argyrides ¹ , Apostolos Apostolou ¹ , Gregoris Demetriades ¹ , Panayiota Antoniou ¹ , Panos Vouterakos ¹ , Michalis Pikridas ¹ , Iasonas Stavroulas ¹ , Mihalís Vrekoussis ^{1,2,3} , Jean Sciare ¹ ¹ The Cyprus Institute, Nicosia, Cyprus; ² Institute of Environmental Physics, Bremen, Germany; ³ Center of Marine Environmental Sciences - MARUM, U of Bremen
5:00pm - 6:00pm Amphitheatre	Exhibitions
6:00pm - 6:40pm	Bus to Aeroscopia
6:40pm - 10:00pm Aeroscopia	Icebreaker - Aeroscopia Food and drinks provided; Recap Lannemezan; Visit museum
10:00pm - 10:40pm	Bus to Toulouse

Tuesday, 24/May/2016

8:00am - 9:00am Registration

Hall

9:00am - 10:20am Science applications - Aerosol / cloud / chemistry

Amphitheatre

9:00am - 9:20am

Airborne Measurement of a New Particle Formation Event in the Atmospheric Boundary Layer

Andreas Platis¹, Jens Bange¹, Barbara Altstädter², Birgit Wehner³, Astrid Lampert³, Markus Hermann²

¹Universität Tübingen, ZAG, Germany; ²Leibniz Institute for Tropospheric Research (TROPOS); ³Airborne Meteorology Institute of Flight Guidance TU Braunschweig

9:20am - 9:40am

Scientific missions of INTA from unmanned research aerial platforms

Neves Seoane-Vieira¹, Ana Corrales-Sierra¹, Susana Osuna-Esteban², Elena González-Toril², Ángeles Aguilera², Jose Cano-Hernández¹, Bartolomé Marqués-Balaguer¹

¹INTA (Instituto Nacional de Técnica Aeroespacial), Spain; ²CAB (Astrobiology Center, CSIC-INTA), Spain

9:40am - 10:00am

Investigation of the Southern Methane Anomaly using Unmanned Octocopters

Rick M. Thomas¹, Colin Greatwood², Tom Richardson², Jim Freer², Rob MacKenzie¹, Rebecca Brownlow³, David Lowry³, Rebecca E. Fisher³, James France⁴, Euan G. Nisbet³

¹The University of Birmingham, UK; ²University of Bristol, Bristol, UK; ³Royal Holloway, University of London, Egham, UK; ⁴Univ. of East Anglia, Norwich, UK

10:00am - 10:20am

EUFAR: a portal for airborne research in Europe

Elisabeth GERARD¹, Phil BROWN², Francesco CAIRO³

¹Météo-France, France; ²Met Office, UK; ³Consiglio Nazionale delle Ricerche, Italy

10:20am - 10:40am Coffee break

Hall

10:40am - 11:00am RPA Public Perceptions

Amphitheatre

10:40am - 11:00am

Public Perception of UAS for Atmospheric Science

Lisa PytlikZillig², Adam Houston¹, Carrick Detweiler¹

¹University of Nebraska-Lincoln, United States of America; ²Nebraska Public Policy Center

11:00am - 11:20am Exhibition pico-presentations

Prud'Hommes

11:20am - 12:20pm Posters & Exhibitions

Hall

12:20pm - 1:20pm Lunch

Hall

1:20pm - 2:20pm Science applications - Aerosol / cloud / chemistry

Amphitheatre

1:20pm - 1:40pm

Electrical charge measurements in clear and cloudy conditions from fixed wing UAVs

Keri Nicoll¹, Giles Harrison¹, Greg Roberts²

¹University of Reading, United Kingdom; ²Meteofrance, Toulouse, France

1:40pm - 2:00pm

Bottom-up and top-down closure of aerosol-cloud interactions using RPAS

Greg Roberts^{1,2}, Radiance Calmer¹, Kevin Sanchez^{1,2}, Gregoire Cayez^{1,3}, Keri Nicoll⁴, Jurgita Ovadnevaite⁵, Murat Bronz⁶, Gautier Hattenberger⁶, Jana Preissler⁵, Danny Rosenfeld⁷

¹Centre National de Recherches Météorologiques, Toulouse, France; ²Scripps Institution of Oceanography, La Jolla, United States; ³École Nationale de la Météorologie, Toulouse, France; ⁴University of Reading, UK; ⁵National University of Ireland Galway, Ireland; ⁶École Nationale de l'Aviation Civile, France; ⁷The Hebrew University of Jerusalem, Israel

2:00pm - 2:20pm

Measuring carbon dioxide mole fractions in the atmosphere with RPAS

Martin Kunz¹, Jošt Valentin Lavrič¹, Wieland Jeschag^{1,2}, Maksym Bryzgalov³, Bertil Hök⁴, Burkhard Wrenger⁵, Pieter Tans⁶, Martin Heimann¹

¹Max Planck Institute for Biogeochemistry, Germany; ²University of Applied Sciences, Jena, Germany; ³SenseAir AB, Delsbo, Sweden; ⁴Hök Instruments AB, Västerås, Sweden; ⁵Ostwestfalen-Lippe University of Applied Sciences, Lemgo, Germany; ⁶NOAA/ESRL, Boulder, Colorado, USA

2:20pm - 3:40pm

Amphitheatre

Instrumentation and payload integration

2:20pm - 2:40pm

Boundary-layer radiosonde and UAV sensors

Anders Petersson

Sparv Embedded AB, Sweden

2:40pm - 3:00pm

Measuring the urban atmosphere with a UAV and Waggle

Robert Jacob, Rajesh Sankaran, Pete Beckman

Argonne National Laboratory, United States of America

3:00pm - 3:20pm

Status Update on iMet-XQ and XF UAV Sensors

Fred Clowney, Joe Barnes

InterMet Systems, United States of America

3:20pm - 3:40pm

Placement of Sensors for Local Wind Measurement by a Hexacopter

Matthew Walker

University of Oklahoma, United States of America

3:40pm - 4:00pm

Hall

Coffee break

4:00pm - 5:00pm

Amphitheatre

Instrumentation and payload integration

4:00pm - 4:20pm

Proof of concept for turbulence measurements with the RPAS SUMO during the BLLAST campaign

Joachim Reuder¹, Line Båserud¹, Stephan T. Krai¹, Marius O. Jonassen^{1,2}, Mostafa Bakhoday Paskyabi¹, Marie Lothon³

¹Geophysical Institute, University of Bergen, Norway; ²The University Centre in Svalbard, Longyearbyen, Norway;

³Laboratoire d'Aérodynamique, University of Toulouse, CNRS, France

4:20pm - 4:40pm

INSTRUMENTATION AND PAYLOAD INTEGRATION IN UAS FOR THE STUDY OF ATMOSPHERIC AEROSOLS AND AIRBORNE MICROORGANISMS

Ana Corrales-Sierra¹, Neves Seoane-Vieira¹, Jose Cano-Hernandez¹, María Jesus Morales de la Rica¹, Francisco Javier Angel-Martínez¹, Fernando Lahoz-Pequerul¹, Juan Tardaguila-Dueso¹, Elena González-Toril², Susana Osuna-Esteban², Angeles Aguilera², Bartolomé Marqués-Balaguer¹

¹INTA (National Institute for Aerospace Technology), Spain; ²CAB (Astrobiology Center), Spain

4:40pm - 5:00pm

CLOUD MAP: Atmospheric Sampling with UAS

Alyssa Avery, Nicholas Foster, Jamey Jacob

Oklahoma State University, United States of America

5:00pm - 6:00pm

Hall

Posters & Exhibitions

7:00pm - 11:00pm

Conference Dinner

Wednesday, 25/May/2016

9:00am - 10:20am Science applications - Boundary layer

Amphitheatre

9:00am - 9:20am

An Evaluation of Wind Measurements From SUMO Collected During the BLLAST Campaign

Phillip Chilson¹, Jennifer Handsley¹, Brandon Centeneo¹, Timothy Bonin², Line Baserud³, Marius Jonassen^{3,4}, Joachim Reuder³

¹School of Meteorology & Advanced Radar Research Center, University of Oklahoma, USA; ²Earth System Research Laboratory, NOAA, USA; ³Geophysical Institute, University of Bergen, Norway; ⁴UNIS – The University Centre in Svalbard, Norway

9:20am - 9:40am

Investigation of the flow in complex terrain with regard to wind-energy research using the small remotely piloted aircraft MASC

Alexander Rautenberg¹, Norman Wildmann¹, Christoph Schulz², Jan Anger², Jens Bange¹

¹Eberhard Karls Universität Tübingen, Germany; ²Universität Stuttgart, Germany

9:40am - 10:00am

3D in-situ measurements of entrainment-related cumulus clouds properties using a swarm of unmanned aerial vehicles

Fayçal Lamraoui¹, Greg Roberts^{1,2}, Frédéric Brunet¹, Simon Lacroix³

¹Météo-France/CNRS, CNRM, Toulouse, France; ²Scripps Institution of Oceanography, San Diego, California, USA; ³LAAS, CNRS, Toulouse, France

10:00am - 10:20am

Atmospheric research with drones in Ny-Ålesund, Svalbard

Stian Solbø, Rune Storvold, Agnar Sivertsen

Norut Northern Research Institute, Norway

10:20am - 10:40am

Coffee break

Hall

10:40am - 12:20pm

Science applications - Polar

Amphitheatre

10:40am - 11:00am

Observations of Air-Sea Interactions in an Antarctic Coastal Polynya Using Small Unmanned Aerial Systems

John Joseph Cassano

University of Colorado, United States of America

11:00am - 11:20am

RPA-borne measurements of stable and convective offshore boundary-layers over the North Sea

David James Tupman, Andreas Platis, Alexander Rautenberg, Norman Wildmann, Jens Bange

University of Tübingen, Germany

11:20am - 11:40am

The ISOBAR project (2016--2018) -- Observations on the stable polar Atmospheric Boundary Layer from Remotely Piloted Aircraft Systems

Stephan T. Kral^{1,3,4}, Joachim Reuder¹, Stephanie Mayer², Marius O. Jonassen^{3,1}, Timo Vihma^{4,3}, Jens Bange⁵, Burkhard Wrenger⁶, Siegfried Raasch⁷, Zbigniew Sorbjan⁸, Line Baserud¹, Anak Bhandari¹

¹Geophysical Institute, University of Bergen, Norway; ²Uni Research AS, Bergen, Norway; ³The University Centre in Svalbard, Longyearbyen, Norway; ⁴Finnish Meteorological Institute, Helsinki, Finland; ⁵University of Tübingen, Germany; ⁶University of Applied Sciences Ostwestfalen-Lippe, Höxter, Germany; ⁷Leipzig University Hannover, Germany; ⁸Marquette University, Milwaukee, USA

11:40am - 12:00pm

Observations on the Arctic Boundary Layer using the Small Unmanned Meteorological Observer (SUMO) during polar night

Marius O. Jonassen^{1,2}, Stephan T. Kral^{2,1}, Siiri Wickström^{1,2}, John J. Cassano³, Daniel Martinez⁴, Martin Müller⁵, Christian Lindenberg⁵, Line Baserud²

¹The University Centre in Svalbard, Longyearbyen, Norway; ²Geophysical Institute, University of Bergen, Norway; ³Cooperative Institute for Research in Environmental Sciences, University of Colorado, BO, USA; ⁴Grup de Meteorologia, Departament de Física, Universitat de les Illes Balears, Palma de Mallorca, Spain; ⁵Lindenberg und Müller GmbH & Co. KG, Hohenhameln, Germany

12:00pm - 12:20pm

An update on the ERASMUS (Evaluation of Routine Atmospheric Sounding Measurements using

Unmanned Systems) Campaign

Gijs de Boer^{1,2}, Dale Lawrence¹, Scott Palo¹, Brian Argrow¹, Gabriel LoDolce¹, James Mack¹, Nathan Curry¹, William Finamore¹, Joshua Fromm¹, Cameron Trussel¹, Phillip D'Amore¹, Douglas Weibel¹, Chuck Long^{1,2}, Ru-Shan Gao², Hagen Telg^{1,2}, Beat Schmid³, Mark Ivey⁴, Albert Bendure⁴, Geoff Bland⁵

¹University of Colorado - Boulder, United States of America; ²NOAA Earth System Research Laboratory; ³Pacific Northwest National Laboratory; ⁴Sandia National Laboratories; ⁵NASA Wallops

12:20pm - 1:20pm

Hall

Lunch

1:20pm - 2:20pm

Amphitheatre

Panel Discussions

2:20pm - 2:40pm

Amphitheatre

Future directions / next meeting

2:40pm - 3:00pm

Amphitheatre

Closing presentation

3:00pm - 3:40pm

Prud'Hommes

Posters & Exhibitions

3:40pm - 4:00pm

Hall

Coffee break

4:00pm - 5:00pm

Hall

Take down posters and exhibits

