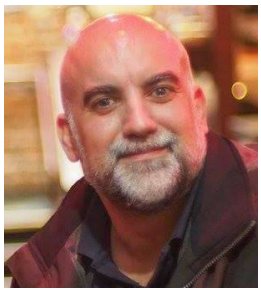
CURRICULUM VITAE (31.12.2018)

1. Basic information



Name: Ivan Mammarella

Nationality: Italy

Date of birth: 26.03.1973

Status: Married, two children.

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Current position: University Researcher.

Employer: University of Helsinki, Institute for Atmospheric and Earth System Research/Physics (INAR)

Address: P.O. Box 68, Exactum, room D116, FI 00014 Helsinki (Finland).

Education:

2014 Title of Docent (Meteorology), University of Helsinki.
2004 PhD (Environmental Geophysics) - ISAC-CNR and University of Messina, Italy.
1998 MSc degree (Environmental Science), University of Urbino, Italy.

Previous work experiences:

01/2017-12/2018	University Lecturer at University of Helsinki
01/2008-12/2016	University Researcher at University of Helsinki
05/2005-12/2007	Postdoc Researcher at University of Helsinki
03/2005-04/2005	Visiting scientist at Risoe-DTU, Denmark
02/2004-02/2005	Postdoc fellowship at Finnish Meteorological Institute, Finland
05/2000-01/2004	Postgraduate fellowship at ISAC-CNR Bologna, Italy
11/2001	Visiting scientist at DAMTP of University of Cambridge, UK
03/2000-04/2000	Postgraduate fellowship, Regional Met Service of Environment Protection Regional Agency - Emilia-Romagna, Italy
09/1999-02/2000	Postgraduate fellowship, CEA – Trento (Italy).

2. Qualifications in research and doctoral training

2.1 Leadership in research work

I am leading the Micrometeorology and Greenhouse gas group at the INAR - Institute for Atmospheric and Earth System Research/Physics (University of Helsinki).
More details on group members and activities can be found at http://wiki.helsinki.fi/display/micrometeorology/Micrometeorology. I am the principal investigator (PI) of Hyytiälä-SMEAR II ICOS station (Class I) and PI in several national and international projects (including FP7 and Horizon 2020 funded projects). I have a well-established network of national and international collaborators. See below for details.

2.2 Nature and scope of publications

I have published over 100 peer-reviewed scientific articles (2 in *PNAS*, 3 in *Nature Scientific Reports* and 3 in *Geophysical Research Letters*). My h-index is 22 and number of citations is 1320 (Scopus,31.12.2018). My publications are mostly related to biosphere-atmosphere interactions and, in particular, on measuring and modelling vertical exchange processes of momentum, energy, greenhouse gases, other trace gases and aerosol particles between the atmosphere and different terrestrial ecosystems (forest, wetland and lake). Modelling and experimental studies on atmospheric boundary layer meteorology are also part of my publications. During last 6 years, I have focused more on air-water interaction, and in particular (among other things) to the relations between water-column stratification, shear and buoyancy-induced water turbulence and gas transfer velocity in freshwater ecosystems.

2.3 Project Management and funding (Principal Investigator, total funding around 850 k€)

2017-2020 Task leader in Horizon 2020 project *"RINGO – Readiness of ICOS for Necessities of integrated Global Observations".* (270 000 €).

2018-2019 Leader and Coordinator of INTERACT project *"GHG-FLUX+ - Greenhouse gas exchange in boreal wetland and freshwater ecosystems: a multi-scale approach."* (18 800 €).

2016 Leader and Coordinator of NordForsk project *"Summer School Boreal wetlands: from plant bio-diversity and ecophysiology to biogeochemical cycles and greenhouse gases budgets."* (36 520 €).

2013-2016 Leader and Coordinator of FP7 project *"GHG-LAKE - Towards a comprehensive understanding of transport of energy and greenhouse gases in lacustrine ecosystems."* (175 000 €).

2014 Leader and Coordinator of INTERACT project *"GHG-FLUX - Greenhouse gas exchange in boreal wetland and freshwater ecosystems: a multi-scale approach."* (27 195 €).

2011-2015 Work Package leader in FP7 project *"InGOS – Integrated non-CO_2 Greenhouse Gas Observing System"*. (180 000 €).

2006 University of Helsinki Chancellor travel grant. (1200 €).

Other projects in which I am/have been involved as participant: EU projects (CARBOEUROPE, NITROEUROPE, ICOS, GHG-EUROPE), Nordic Centre of Excellence (NECC and DEFROST), Academy of Finland projects (ICOS-FINLAND, CarLAC, CARBARC).

2.4 Scientific expertise duties

2.4.1 Referee for scientific journals

Biogeosciences (2010-), Boundary Layer Meteorology (2006-), Agricultural and Forest Meteorology (2009-), Tellus B (2010-), Atmospheric Chemistry and Physics (2009-), Environmental Science and Technology (2012-), Journal of Geophysical Research(2012-), Journal of Hydrometeorology (2010-), Quarterly Journal of the Royal Meteorological Society (2013-), Nature Geosciences (2016).

2.4.2 Reviewer of research project proposals

EU H2020-MSCA-RISE (2018), Czech Science Foundation (2016), ExpeER TNA application (2013), National Geographic grant (2013), Estonian Science Foundation post-doctoral grant (2012).

2.4.3 Examiner of MSc theses

- Annika Nordbo, 2009, M.Sc., University of Helsinki, Faculty of Science.
- Pavel Alexeychik, 2011, M.Sc., University of Helsinki, Faculty of Science.
- Olli Peltola, 2011, M.Sc., University of Helsinki, Faculty of Science.
- Jouni Heiskanen, 2012, M.Sc., University of Helsinki, Faculty of Biological and Environmental Sciences.
- Kukka-Maaria Erkkilä, 2015, M.Sc., University of Helsinki, Faculty of Science.
- Lauri Heiskanen, 2017, M.Sc., University of Helsinki, Faculty of Science.
- Arttu Jutila, 2017, M.Sc., University of Helsinki, Faculty of Science.
- Aki Vähä, 2018, M.Sc., University of Helsinki, Faculty of Science.

2.4.4 Experience as a dissertation pre-examiner and opponent

- External member of the examination committee of PhD dissertation by Elin Sundqvist, 12.6.2014, University of Lund (Sweden).
- Examiner of PhD dissertation by Yongmei Gong, 13.2.2018, University of Helsinki (Finland).

2.4.5 Positions of trust, national and international activities

2018-2021 Deputy member, Finnish Scientific Committee on Oceanic Research (representing Finnish Physical Society).

2017- Member of Steering Committee of ATM Master Programme in Atmospheric Sciences, University of Helsinki.

2014 - PI of Mukhrino bog field station, Western Siberia.

2014 - PI of ICOS-Finland station SMEAR II-Hyytiälä (FI-Hyy).

2014 - Member of ICOS Monitoring Station Assembly for Ecosystem Network.

2013 - Member of several ICOS measurement protocol working groups (IRGA for EC; Storage fluxes; CH_4 and N_2O EC flux measurements; EC data processing; lake ecosystems).

2012-2014 Member of Steering Committee of NordForsk Project "NORDFROST".

2011- Member of INAR Principal Investigator Group, University of Helsinki.

2011- 6 international field measurement campaigns (as organizer and/or participants).

2009- 10 international Workshops and Summer Schools (as organizer or co-organizer).

2009-2014 Member of Steering Committee of ESF Project "Tall Tower and surface Research Network for verification of Climate relevant emissions of Human origin in Europe (TTORCH)".

2009-2013 Member of Management Committee of COST Action MP0806 "Particles in turbulence".

2.4.6 Membership in Scientific Societies

2013 - Member, American Geophysical Union (AGU).

2009 - Member, European Geophysical Union (EGU).

2.5 Supervision of under- and post-graduate students

2.5.1 MSc theses

Supervised students (7)

2010-2011 Pavel Alekseychik (Meteorology), *"Night-time thermal decoupling and dranaige flow in a tall vegetation canopy"*.

2010-2011 Olli Peltola (Meteorology), *"Field intercomparison of four methane gas analysers suitable for eddy covariance flux measurements".*

2011-2012 Jouni Heiskanen (Environmental Sciences), *"Modeling gas transfer coefficient of CO_2 in a boreal lake on the basis of eddy covariance measurements".*

2014-2015 Kukka-Maaria Erkkilä (Physics), *"Comparison of eddy covariance, floating chamber and boundary layer model flux measurements of methane and carbon dioxide over a boreal lake".*

2016-2017 Lauri Heiskanen (Meteorology), *"Uncertainty in forest-atmosphere exchange of energy and carbon dioxide based on two vertically displaced eddy covariance set-ups"*.

2016-2018 Aki Vähä (Hydrosphere Geophysics), *"Gas transfer velocity inferred from direct measurements of water turbulence".*

2017-2018 Pak Lun Fung (Physics), *"Direct measurements of ozone flux and deposition velocity over lake".*

Current students (3)

2017- Michael Lindell (Meteorology).

2018- Joonatan Ala-Könni (Hydrosphere Geophysics).

2018- Aleksi Arola (Hydrosphere Geophysics).

2.5.2 PhD theses

Supervised students (4)

2010-2012 Annika Nordbo, *"Extending the applicability of the eddy-covariance flux-measurement technique".*

2013-2015 Jouni Heiskanen, *"Lake-atmosphere greenhouse gases exchange in relation to atmospheric forcing and lake biogeochemistry".*

2012-2016 Olli Peltola, *"Towards more consistent estimates of methane fluxes by the eddy covariance technique".*

2012-2017 Pavel Alekseychik, *"Multiscale studies of the peatland-atmosphere interactions in northern Eurasia".*

Current students (3)

2014- Maria Provenzale, *"Greenhouse gas exchange over inland water bodies"*

2016- Kukka-Maaria Erkkilä, *"Carbon cycle measurements in different ecosystems in the boreal region".*

2018- Toprak Aslan

2018- Aki Vaha

2.5.3 PostDoc (4)

Jouni Heiskanen (May 2015-Feb 2017), Pavel Alekseychik (Jan 2018-Aug 2018), Olli Peltola (April 2016-Aug 2018), Ville Kasurinen (May 2016-Aug 2018).

2.7 Scientific Awards

Kipp & Zonen Award for Boundary Layer Meteorology 2007 granted during the 7th Annual Meeting of the European Meteorological Society (EMS). Spain, 1-5 October 2007.

2.8 National and international collaborations

- Finnish Meteorological Institute, Finland (Prof. Sergej S. Zilitinkevich; Mr. Tuomas Laurila).
- University of Helsinki, Finland (Dr Anne Ojala and Prof Timo Vesala)
- University of Eastern Finland, Finland (Prof Eeva-Stiina Tuittila)
- University of Lund, Sweden (Prof Anders Lindroth, Dr Alex Vermeulen and Prof. Janne Rinne)
- University of California, USA (Prof Sally MacIntyre)
- Moscow State University, Russia (Dr Victor Stepanenko)
- Yugra State University, Russia (Prof Elena Lapshina)
- Saint Petersburg State University, Russia (Prof Irina Fedorova)
- University of Tuscia, Italy (Prof Dario Papale)
- Uppsala University, Sweden (Prof Anna Rutgersson)
- Linköping University, Sweden (Prof David Bastviken)

3. Teaching qualifications

3.1 Teaching experience

I started my teaching when I started to work as PostDoc at the University of Helsinki, being assistant in standard and intensive courses between 2007 and 2010. Then in 2011 I started as teacher in several basic and advanced courses, as well as teacher and organizer of several intensive courses (see below). In April 2014 I have obtained the title of Docent in Meteorology at University of Helsinki. As seen from my courses list, I have quite strong experience in teaching both basic and advanced courses related to **fluid phenomena and turbulence, surface-atmosphere interactions, flux measurement techniques and micrometeorology.**
For advanced courses, I use multi-form teaching and evaluation methods (i.e., in addition to lecturing, students read and present research articles, write short essays, and give final group-presentations). I always encourage students to participate on advanced study courses at the University of Helsinki, and international summer schools abroad. Moreover, particular attention is given to their international dimension. Doctoral students are involved in international field campaigns and research mobility abroad. In this way, the students acquire not only high degree of interdisciplinarity during their work, but also their PhD studies and results have a broad vision and international dimension.
I have organized (co-organized) 10 international Workshops and Summer Schools since 2009. I have supervised 10 Bachelor students, 6 Master students, and 4 PhD students and 4 PostDoc. Currently, I am supervising 3 PhD students and 4 Master students.

During recent years I have initiated and developed an international intensive course on eddy covariance technique (*EddyUH: a software for eddy covariance flux calculation*), which I have been running for three times from 2012 (see https://www.atm.helsinki.fi/Eddy_Covariance/EddyUHcourse_2015.php). A total of about 70 students from 15 different countries have participated to the courses so far. Feedbacks from students have been always positive.
See below for other courses and summer schools I have organized, co-organized or simply I have given a lecture.

Teaching at Department of Physics, University of Helsinki (Basic and advanced courses):

- Fluid Phenomena (5 ECTS), Teacher (Fall 2013 and 2014 and 2015). Assistant (Fall 2007 and 2009).
- Theory of micrometeorological flux measurement methods (5 ECTS), Teacher (Fall 2011, Spring 2014, 2015, 2016, 2018).
- Forest-Atmosphere Interaction (5 ECTS), Assistant and Teacher (Fall 2008, 2010 and 2012).
- Theory of Turbulence (5 ECTS), Teacher (Spring 2017)

- Descriptive Oceanography (5 ECTS), Teacher (Fall 2017)
- Field course in micrometeorology and hydrology (5 ECTS), Teacher (Spring 2017, Fall 2018).
- Physics of lakes and rivers (5 ECTS), Teacher (Fall 2018)

Other teaching in International Scientific Schools and Intensive Courses:

- 1st Summer School: "Boreal wetlands: from plant biodiversity and ecophysiology to biogeochemical cycles and greenhouse gas budget" (5 ECTS). 24.08-03.09.2016, Mukhrino field station, West Siberia, Russia *(Organizer and Lecturer).*
- 3rd Training course/workshop for PhD students: "EddyUH: a software for eddy covariance flux calculation" (3 ECTS). 23-27.02.2015, Helsinki, Finland *(Organizer and Lecturer).*
- 2nd Training course/workshop for PhD students: "EddyUH: a software for eddy covariance flux calculation" (3 ECTS). 21-25.01.2013, Helsinki, Finland *(Organizer and Lecturer).*
- 1st Training course/workshop for PhD students: "EddyUH: a software for eddy covariance flux calculation" (3 ECTS). 16-20.01.2012, Helsinki, Finland *(Organizer and Lecturer).*
- 3rd Summer School **"**Challenges in measurements of greenhouse gases and their interpretation**" (**5 ECTS) September 20.05 - 29.05.2015, Hyytiälä, Finland *(Co-Organizer and Lecturer).*
- 2nd Summer School **"**Challenges in measurements of greenhouse gases and their interpretation**" (**5 ECTS) September 30.09 - 11.10.2013, Hyytiälä, Finland *(Co-Organizer and Lecturer).*
- 1st Summer School for PhD students: "Challenges in measurements of greenhouse gases and their interpretation", (5 ECTS) September 27.09 - 04.10.2011, Hyytiälä, Finland *(Co-Organizer)*.
- COST Action ES0804 Summer school on Flux measurement techniques: methods, sensors, databases and modeling (5 ECTS). 11–20.09.2011, Tuczno Castel, Poland (Lecturer).
- Spring School on Atmosphere-Biosphere Interactions on Eddy Covariance technique (5 ECTS). 01-05.03.2010, University of Kuopio (Lecturer).
- MSc field course on Physics and chemistry of air pollution and their effects: field course and data analysis, Hyytiälä (Finland), 10-19.03.2008 (Assistant).
- International Course on "Geophysical turbulence and boundary layers: nature, theory and role in Earth's systems" (5 ECTS), 28 May - 1 June 2007, Helsinki. Organised by University of Helsinki and Finnish Meteorological Institute (Lecturer).
- International Summer School for PhD students: "Planetary Boundary Layers over complex terrain and vegetated land surfaces", Sodankylä, Finland, 4-14 June 2005 (Organizer and Lecturer).

3.2 Pedagogical approach and training

About two years ago I participated to a training course organised by University of Helsinki, "Leadership Program for Academic Staff **"** (City Centre Campus 30.10.2014 - 31.3.2015). The course was excellent and very interesting. In particular, as student supervisor, I have highly appreciated the 360° feedback (given by my students and other colleagues in the micromet group) about my leader and supervisor roles. Moreover, the course was an excellent opportunity to write a strategy plan of the group, starting from the University and Department strategy plans.
Until now, I did not attend any pedagogical training courses, as they were not available during my Master and Doctoral studies. I have now registered to the courses University Pedagogy 1 & 2 given in Spring 2018, as part of my personal training. Nevertheless, I pleasantly remember how, during the Docent teaching demonstration (31.01.2014), one of the committee's members was positively surprised about my teaching skills and methods, even if I never had pedagogical training. I have strong opinion that teaching is a learning process, and I have learned quite much during these years both from my colleagues and from students.

3.3 Teaching materials

Besides textbooks, for my courses I use a combination of powerpoint slides and hand written notes. Both are given to the students the day before the lecture, usually via Moodle course pages. Coherently, during the lecture, students follow the slides, and at the same time I often used the whiteboard to derive physical laws and equations, whose derivation is in the hand written notes. For the most difficult contents of the course, I often use examples from real life and videos, to facilitate the students to understand the meaning of certain concepts and/or equations. For example, in the *Fluid Phenomena* course, I usually show a video to explain what is a non-Newtonian fluid, where some other students are able to walk on such fluid without sinking if they keep moving. Sometimes I have used also one approach in which the student is the main actor preparing some teaching material as a powerpoint presentation. For example, I have used this approach in the advanced course *Theory of micrometeorological flux measurement methods*. Here the students use, for example, one month of micromet rawdata measured over forest or wetland, they write a processing code by themselves step-by-step, they analyse the obtained flux data and at the end of the course they present their results and findings. For the student, making a presentation, is a way of learning, and for me it is a tool to evaluate and interact more with the student.

3.4 Other teaching merits

As mentioned above, during the last few years I have organised several international intensive courses and summer schools, for which I have received financial support for a total amount of around 60 k€ from different sources: European Science Foundation(ESF), The Norwegian Centre for International Cooperation in Education (SIU) and NordForsk.