

CURRICULUM VITAE

Anni Määttänen

September 2, 2022

1 Personal data

Anni Elisa Määttänen

19th April 1979, Mikkelin mlk, Finland

Senior scientist (directrice de recherche) of the CNRS, LATMOS,

Sorbonne Université, Université de Versailles Saint-Quentin-en-Yvelines, France

LATMOS (Laboratoire Atmosphères, Milieux, Observations Spatiales)

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2 Education and Training

- Tampereen yhteiskoulu, Tampere, Finland: 1998 Matriculation examination
- University of Helsinki (UH), Finland: 2002 M.Sc. (meteorology)
- University of Helsinki, Finland: Ph.D. (meteorology), 1.9.2002-23.11.2007. Thesis title “Investigations of planetary boundary layer processes and particle formation in the atmosphere of planet Mars”, supervisors: prof. Hannu Savijärvi and Dr. Hanna Vehkamäki)
- Université Versailles Saint-Quentin-en-Yvelines, France, 2016: Habilitation à diriger des recherches (HDR, astronomy and astrophysics).

3 Language skills

Finnish: mother tongue

English and French: fluent, good professional vocabulary

Italian and Swedish: working knowledge

Voluntary translator of ESO, 01/2015 (potw1501) - 01/2019 (potw1902) (Translations from English to Finnish of the "Picture of the Week")

4 Previous professional appointments

Finnish Meteorological Institute (FMI):

- Acting weather observer 1995-2000
- Research assistant: 1998 (2 months), 1999 (3 months)
- Researcher (Ph.D. student in the Graduate school in astronomy and space physics) 1.1.2007-31.12.2007

University of Helsinki (UH), Department of Physical Sciences:

- Fee-paid course assistant 2001-2005 (in total 84 hours)
- Fee-paid lecturer 2006-2007 (in total 41 hours)
- Research assistant 1.6.2001-30.6.2002
- Research scientist 1.9.2002-31.12.2005
- Researcher on a grant 1.1.2006-31.12.2006
- Ph.D. student in the Graduate school in astronomy and space physics 1.1.2007-31.12.2007

Centre National d'Etudes Spatiales:

- Postdoctoral researcher in LATMOS, France, 1.1.2008-30.9.2009

Centre National de la Recherche Scientifique:

- Research scientist (chargée de recherche), LATMOS, France, 1.10.2009-30.9.2020
- Senior scientist (directrice de recherche), LATMOS, France, 1.10.2020-today

5 Scientific expertise

- Analysis of satellite observations (Mars Express, Mars Reconnaissance Orbiter)
- Nucleation theory and modeling (theory and atmospheric applications)
- Cloud microphysics (Mars CO₂ ice clouds, Venus sulfuric acid clouds)
- Planetary boundary layer modeling

Publications

- 46 peer-reviewed articles
- 5 book chapters
- >150 conference abstracts (5 invited)

Distinctions

- Prime d'Excellence Scientifique (merit-based bonus) of the CNRS (2011-2014)
- Prime d'Encadrement Doctoral et de Recherche (merit-based bonus) of the CNRS (2015-2018)

6 Teaching experience

Supervisor of the following Bachelor's students:

- Antoine Mille (L3 ENS Paris-Saclay, 90%, 05-07/2019)

Supervisor of the following Master's students:

- Constantino Listowski (M2 astro, 50%, 03-06/2009)
- Lucky Puspitarini (M2 astro, 50%, 03-06/2011)
- Sabrina Guilbon (M1 SEN UVSQ, 100%, 05-06/2013)
- Sabrina Guilbon (M2 planétologie, 50%, 03-07/2014)
- Luc Narivelo (M1 SEN UVSQ, 50%, 04-06/2015)
- Albert Leboucher (Master Univ. Delft, 07-12/2016)
- Deborah Bardet (M2 OACOS, 03-07/2018)
- Lucas Teinturier (M1 level, Ecole Centrale de Lyon, 50%, 05-08/2019)
- Jeanne Davoult (M2 SOAC, 50%, 03-07/2020)
- Albert van Wijngaarden (M2 Arctic Studies, 01-04/2022)

Supervisor of the following Ph. D. students (HDR since 2016):

- Constantino Listowski, "Modélisation des nuages de dioxyde de carbone (CO₂) sur Mars: application aux nuages mésosphériques", 01/10/2010-02/12/2013 (50%)
- Sabrina Guilbon, "Modélisation des nuages vénusiens : développement d'un modèle de nuages pour un modèle de climat vénusien global", 01/10/2014-27/04/2018 (90%)
- Vincent Caillé, "La dynamique des nuages convectifs de CO₂ dans la nuit polaire avec le modèle méso-échelle martien", 01/10/2019-31/01/2023 (50%, ANR JCJC)
- Thibaut Lameille (interrupted), "How to govern solar radiation management? Scientific and political assessment of implementation", 01/10/2020-31/08/2022 (50%, ITE-SU)
- Nicolas Streel, "Rôle des nuages dans la composition de l'atmosphère vénusienne", 01/10/2022-30/09/2025 (50%)

Supervisor of post-docs:

- Joachim Audouard: Modélisation des nuages de dioxyde de carbone (CO₂) sur Mars avec un modèle de climat global, 2016-2017 (LabEx ESEP)
- Christophe Mathé: Expliquer la formation des nuages mésosphériques de CO₂ avec le MGCM, 2019-2021 (ANR JCJC)

Lectured courses (UH, Division of Atmospheric Sciences):

- Spring 2005: Lecture on planetary atmospheres on the course Introduction to meteorology and weather observations (1h)

- Spring 2006 and spring 2007: Introduction to meteorology and weather observations (total: 40 hours of lectures, 16 hours of exercises)
- Spring 2019: Two invited lectures on the course: Introduction to planetary atmospheres (4h)
- Spring 2022: Two invited lectures on the course: Introduction to planetary atmospheres (4h)

Lectured courses (UVSQ, M2 in planetology):

- 11/2016, 10/2017: Lecture on microphysics and clouds in planetary atmospheres (3h/year)

Lectured courses (ENS, L3 géosciences):

- 03/2018, 03/2019: Two lectures (and exercises) on microphysics and clouds in planetary atmospheres (4h/year)

Lectured courses (ENS, M1 géosciences):

- November 2019: Planning of a new course (Composition and climates of planetary atmospheres), three lectures, supervising a project and exercises on microphysics and clouds (6h lectures, 6h project+exercises)

Lectured courses (Master's level, PSIA, SciencesPo):

- Since 2018, course "From climate sciences to climate intervention?" (half of the lectures, 12h, in 2018-2021; full course, 24h, from 2022)

Seminar course (Ecole doctorale 129):

- Spring 2022, organisation and lectures on a seminar course "Intervention climatique : science, enjeux et questions" for the PhD students of ED129 with many invited speakers.

Supervising exercise classes (UH, Physics department, Division of Atmospheric Sciences):

- Autumn 2001: Physical climatology (10 h)
- Autumn 2002: Physics of the boundary layer I (10 h)
- Spring 2003: Dynamic meteorology II (22 h)
- Autumn 2003: Dynamic meteorology III (20 h)
- Spring 2004: Dynamic meteorology II (22 h)

Development and planning of teaching, UH Dept. of Physical Sciences:

- Planning of a change in evaluation methods in the course 'Introduction to meteorology and weather observations' during spring 2006. The changes were applied and tested during springs 2006&2007 and introduced in a national conference aimed at improving university teaching.

7 Research grants and major stipendiary support

Research grants and projects

- PhD grant from the Institut de la Transition Environnementale of Sorbonne Université (ITE-SU) with Carola Kloeck (co-supervisor) and Thibaut Lameille (PhD student), 2020-2022 (thesis interrupted)
- PI of the ANR JCJC (Jeune Chercheure Jeune Chercheur) project "Modeling exotic CO₂ clouds on Mars", 280 ke, 2019-2022 (PhD student + post-doc).
- Responsible of a two-year postdoctoral grant of the LabEx ESEP : modeling and observations of Martian CO₂ clouds (selected in 2015, post-doc period February 2016 - January 2018).
- IPSL Solar System Group grant for inviting Prof. J. M. C. Plane from University of Leeds for a visit of one week (May 2017).
- Participant in a grant application for the Finnish cultural foundation for funding the Science School of Finnish high school students in Ile-de-France in October 2015 (selected, responsible K. Kääriäinen, Mikkel high school, Finland).
- Responsible of the ATMARVEN 2011, 2014 and 2017 projects funded by the PNP (Programme National de Planétologie) for the Mars/Venus group of LATMOS (2011: 7000e, 2014: 8000e, 2017: 7500e). Collaborator in several other ATMARVEN projects since 2010.
- Participant in the UPWARDS H2020 project, 2015-2018 (coordinator: M.-A. Lopez Valverde, IAA, Granada, Spain).
- IPSL Solar System Group grant for inviting Prof. H. Vehkamäki for a visit of one week (October 2013).
- CNES grant for post-doctoral scientific research, 2008-2009, France.
- Responsible for partner LATMOS in the Europlanet-RI H2020 project (selected, 2015-2019).

Awards, honours and major stipendiary support

- Idman foundation, personal grant (approx. 250 euros) 2000
- Kiukas foundation, personal grant (approx 830 euros) 2001
- European Space Agency, 2 travel grants (1000 euros) 2002, 2006
- Väisälä foundation, 4 travel grants (7600 euros) 2002, 2003, 2004, 2006
- Magnus Ehnrooth foundation, 4 travel grants (6400 euros) 2003, 2005, 2006, 2007
- Association franco-finlandaise pour la recherche scientifique et technique, travel grant (1000 euros) 2005
- Jenny and Antti Wihuri foundation, travel grant (2000 euros), 2005
- Alfred Kordelin Foundation Grant for scientific Ph.D. thesis work, 2006 (12 months)
- Emil Aaltonen foundation, travel grant (1800 euros) 2008
- Postdoctoral fellowship from CNES (24 months), 2008-2009

8 National and international networking

International research visits

- Observatoire de Paris, Meudon, France: 5 visits of 1 month each during 2005-2007.
- Universidad Complutense de Madrid, Madrid, Spain, 11-18/12/2009
- Jet Propulsion Laboratory, CA, USA, 11-12/10/2011 and 11/7/2014
- Several visits to the University of Helsinki since position in France
- ESTEC, Noordwijk, the Netherlands, 6-8/6/2012
- Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, 9-10/5/2016
- University of Leeds, School of Chemistry and ICAS, Leeds, United Kingdom, 26-29/11/2018

Collaborations and co-I positions

- IDS on Mars Express: Mars Express instrument teams (OMEGA, PFS, SPICAM, HRSC)
- Co-I of SPICAM/Mars Express
- Co-I of ACS/TGO/ExoMars (IKI, Russia)
- Collaborator on the InSight mission (co-I: A. Spiga, LMD)
- Univ. Helsinki: nucleation studies, Mars boundary layer studies
- Instituto de Astrofísica de Andalucía, Granada, Spain: Martian middle atmosphere
- Laboratoire de météorologie dynamique: Global Climate Models for Mars and Venus
- University of Leeds: ice nuclei in the mesospheres of Mars and Venus
- Finnish Meteorological Institute: nucleation studies, the MetNet project
- JPL and LESIA/Observatoire de Paris: MCS limb data analysis

9 Membership in scientific societies

- Division for Planetary Sciences of the American Astronomical Society, 2005 -
- American Geophysical Union 2005 -
- The Finnish Association for Aerosol Research, 2006 -
- European Geophysical Union 2010 -

10 Other academic and professional activities

Professional duties and responsibilities

- Co-responsible (with Marion Marchand since 2022, previously with Slimane Bekki) of an interdisciplinary group at LATMOS with a title: "Sulfur and stratospheric particles"
- Interdisciplinary Scientist in the Mars Express mission (January 2016-)
- Co-responsible of the scientific department IMPEC of the LATMOS laboratory (with Cyril Szopa, 02/2014-01/2019)
- Editor of Journal of Geophysical Research - Planets (May 2019-)
- Associate Editor of Journal of Geophysical Research - Planets (Sept 2016-April 2019)
- Member of the Editorial team of the series "Planetary atmospheres", ISTE editions (2017-).
- Convener of the EGU session "Atmospheres of terrestrial planets" 2014-2015 (Co-convener 2010-2013)
- Co-convener of the EPSC session "Aerosols and clouds in planetary atmospheres (2015, 2017, 2019)
- Convener of the EPSC session "Atmospheres of terrestrial planets" 2018-2019 (Co-convener 2016-2017)
- Co-organizer of the LATMOS internal colloquium, April 2011, and the related departmental seminars (March-April 2011)
- Organizer of a Science school for Finnish high school students during the Fête de la Science, visits at LATMOS and Ile-de-France area (annually in October, 2012-2018)
- Participant in the project InSight of Météo à l'école
- Elected member of the local bureau of the CLAS (2013-2016)
- Tutor of Ph.D. students at LATMOS 05/2012-12/2015
- Mentor in the EGU Women in Geosciences mentoring program (2011-2012)
- Responsible of organizing the seminars of LATMOS (09/2009-03/2012)
- Initiator, organizer and chair of biweekly guidance meetings for Ph.D. students and post-doctoral researchers in LATMOS 2008-2010 (still ongoing as monthly meetings).
- Proposal manager and Co-I (03-04/2010) in the MIRTIS project, sent to the Announcement of Opportunity of NASA for the Mars Trage Gas Orbiter 2016.
- Organizer of SPICAM/SPICAV instrument group meetings in LATMOS 2008-2011.
- Co-organizer of visits of M2 students (Astronomy&Astrophysics) in LATMOS (2008&2009)
- Co-organizer of Mars group meetings of UH and FMI 2002-2007.
- Co-organizer of the simulation group guidance meetings in UH, 2005-2007.
- Responsible of activity reports of the simulation subgroup of UH, 2005-2007.

- Responsible of organizing exams in meteorology at the Department of Physics in University of Helsinki, 2002-2004.
- Participation in the organisation of the Space 2003 and Space 2005 expositions in Helsinki, 2003 and 2005

Referee of academic degrees

- Examiner of the Ph.D. of G. Martínez-Martínez, U. Complutense de Madrid, Madrid, Spain, 06/2010
- Examiner of the Ph.D. of H. Chen-Chen, U. of the Basque Country, Bilbao, Spain, 07/2019
- Examiner of the Ph.D. of S. Jimenez-Monferrer, U. of Granada, Granada, Spain, 10/2019
- Examiner of the HDR of S. Guerlet, Sorbonne Université, 02/2020
- Member of the thesis advisory committee of A. Martinez (LATMOS, 2018-2020)
- Member of the thesis advisory committee of A. Chatain (LATMOS, 2018-2020)
- Member of the thesis advisory committee of G. Milcareck (LMD/LATMOS, 2021-2024)
- Member of the thesis advisory committee of V. Steichen (LATMOS, 2021-2024)
- Member of the thesis advisory committee of Y. Leseigneur (IAS, 2021-2024)

Representative in national and international groups and associations

- Member of the Comité scientifique of the Laboratoire d'Excellence ESEP (2017-2021)
- Member of Working Group (WG) "Jeunes Talents 2014", nominated by the President of the CNRS (see also "Formation"): General organisation of the meetings, work schedule planning. The WG produced a booklet on how to improve the interactions and communication between the different professions in the CNRS and how to improve conditions at work (http://blog-rh.cnrs.fr/wp-content/uploads/2017/03/CahierRecettes_web.pdf). The Human Resources of the CNRS launched an annual project call based on this work.
- Representative of LATMOS in the Working Group "Animation scientifique" of the department "Science de la Planète et de l'Univers" of the Paris-Saclay University (2014-2015)
- Member of the International Space Science Institute Team "Venus clouds" (2013-2014)
- Member of the International Space Science Institute Team "Mars Planetary Boundary Layer" (2009-2010)
- Member of the International Commission of Planetary Atmospheres Environments and their Evolution (ICPAE, 2009-2014)

Co-organizer of the following scientific conferences

- LOC member of The Fourth Mars Atmosphere Modeling and Observations Workshop, Paris, France, 8-11/2/2011

Referee of Scientific Journals

- Journal of Geophysical Research (Planets)

- Icarus
- Planetary and Space Science
- Geophysical Research Letters
- Astronomy&Astrophysics
- Planetary Science Journal

Invited presentations in conferences

- A. Määttänen, J. Merikanto, H. Henschel, J. Duplissy, R. Makkonen, I.K. Ortega, and H. Vehkamäki: Improved parameterizations for neutral and ion-induced H₂SO₄-H₂O particle formation. International Aerosol Modeling Algorithms Conference 2019, UC Davis, Davis, Etats-Unis, 4-6 Dec 2019.
- A. Määttänen: Detecting, observing and explaining the mesospheric CO₂ clouds on Mars. Annual Aerosol Science Conference, University of Birmingham, UK, November 7, 2019.
- A. Määttänen, C. Listowski: Evidence of Meteor Smoke Particles as precursors for formation of mesospheric clouds on Mars. EGU General Assembly 2017.
- A. Määttänen, B. Gondet, F. Montmessin, H. Hoffmann, F. Gonzalez-Galindo, A. Spiga, C. Listowski and J.-P. Bibring: Martian Mesospheric CO₂ Clouds: a Review of a Decade of Studies. 2016 AGU Fall Meeting, 12-16 Dec 2016, San Francisco, California, USA.
- A. Määttänen et al. : Equatorial CO₂ clouds on Mars: OMEGA and HRSC data analysis. Third International Mars Atmosphere Modelling and Observations Workshop, Williamsburg, USA, 10-13/11/2008.
- Invited talk for a general public at “The Physics Days”, the 45th annual meeting of the Finnish Physical Society, Helsinki, Finland, 29/3/2011.

Seminars

- 11/12/2020 (invited) IPSL solar systems group webinar series: "L'atmosphère martienne vue par Mars Express"
- 27/11/2018 (invited), ICAS external seminar series, University of Leeds: Faraway, so close? Studying clouds on Mars and Venus
- 10/5/2016 (invited), Karlsruhe Institute of Technology, Germany: Faraway, so close? Studying clouds on Mars and Venus
- 7/7/2012 (invited), ESTEC/ESA, Noordwijk, the Netherlands: High-altitude CO₂ clouds and CO₂ non-LTE emission on Mars: MEx/OMEGA observations
- 15/12/2009 (invited), Universidad Complutense de Madrid, Spain: The Martian Planetary Boundary Layer
- 22/1/2009, Observatoire de Paris, Meudon, France: Les nuages de CO₂ équatoriaux sur Mars: une étude combinée MEx/OMEGA et MEx/HRSC.
- 5/12/2007, Observatoire de Paris, Meudon, France: A local dust storm seen by MEx/OMEGA and MEx/PFS.

- 4/4/2007, University of Helsinki, Helsinki, Finland: Particle formation in the Martian atmosphere. Seminar series in aerosol and environmental physics.
- 28/3/2007, University of Helsinki, Helsinki, Finland: Weather on Mars: sunshine or dust storms? Seminar series in aerosol and environmental physics.
- 14/3/2007, University of Helsinki, Helsinki, Finland: Aerosol and boundary layer processes in the Martian atmosphere. Research seminar of the graduate school in astronomy and space physics.
- 26/1/2007, University of Helsinki, Helsinki, Finland: Particle formation in the Martian atmosphere. Seminar series for graduate students.
- 1/12/2006, Observatoire de Paris, Meudon, France: Particle formation in the Martian atmosphere.
- 24/11/2006, Laboratoire de Météorologie Dynamique, Paris, France: Particle formation in the Martian atmosphere.
- 16/11/2006, Service d'aéronomie, Verrières-le-buisson, France: Particle formation in the Martian atmosphere.

Outreach

- Participant in the InSight projet of Météo à l'école (2017): formatting and distribution of Curiosity meteorological data for secondary and high school teachers for the preparation of pedagogic resources
- Organiser of School of Science for a group of high school (physics) students of the Mikkeli high school annually in October, 2012-2018. Three days of visits in laboratories (LATMOS, IAS) and a science centre (Cité des Sciences or Palais de la Decouverte) in the Paris area.
- Invited talk for a general public in "The Physics Days", the 45th annual meeting of the Finnish Physical Society, Helsinki, Finland, 29/3/2011.
- Two general public seminars at Mikkeli high school, Finland (2010 and 2015)
- Participation in the Open Doors at LATMOS of the Fête de la Science (2012, 2013, 2014, 2015)
- Participation in two articles in Science&Vie magazine (January 2013, February 2014)

Formation and training courses

- Management formation "Jeunes Talents du CNRS" (Promotion Marc Bloch), organized by the Direction Déléguée aux Cadres Supérieurs (DDCS) of the CNRS. Participants (24) were selected by the DDCS after recommendations from the CNRS Institute Directors, 11 days, 2014.
- METIER (METHods of Interdisciplinary Environmental Research) Graduate Training Course No. 1: Remote sensing of the atmosphere. 25.-29.9.2006, Ispra, Italy. Course offered by PEER (Partnership for European Environmental Research) and funded by the European community: participants selected via application procedure.
- The role of organic aerosols in cloud formation, CBACCI, Hyttiälä, Finland, August 2004

- Measurements of atmospheric aerosols Part I: Basics in aerosol physics and sampling techniques, CBACCI, May 2004, Hyytiälä, Finland
- Arctic air pollution, biosphere-atmosphere relations, CBACCI winter school, March 2004, Värriö, Finland
- Several CBACCI summer and winter schools in Hyytiälä and Värriö (SMEAR I and II stations), Finland, 2003–2004
- Formation and transformation of atmospheric aerosols, CBACCI summer school, June 2003, Hyytiälä, Finland