

# Master's Programme in Meteorology, Atmospheric and Climate-System Sciences (ATM-MP)



# INAR

INSTITUTE FOR ATMOSPHERIC AND  
EARTH SYSTEM RESEARCH



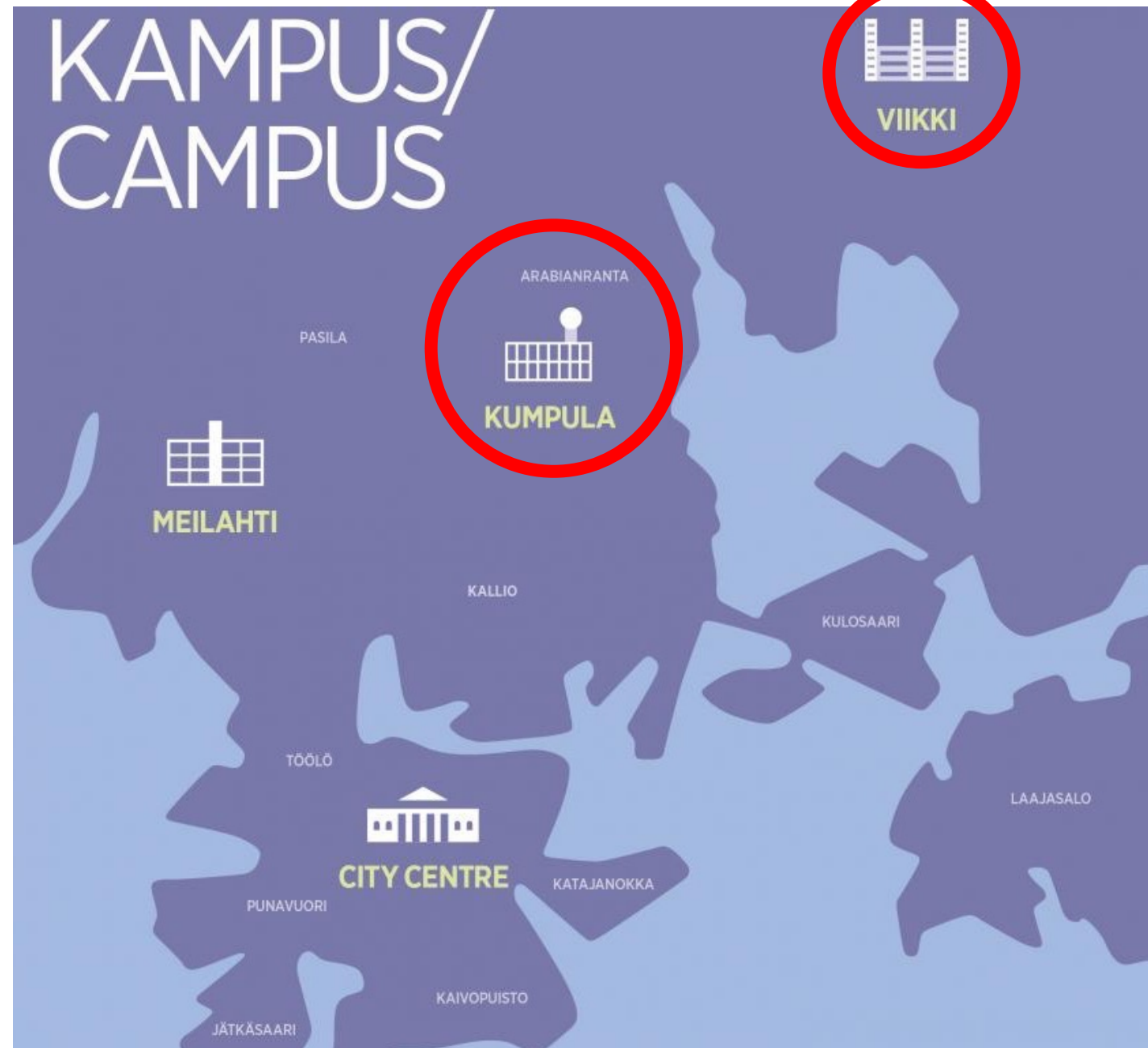
## Multidisciplinary research and studies

- In the [Master's Programme in Meteorology, Atmospheric and Climate-System Sciences](#), you can study atmospheric chemistry and aerosol physics, biosphere-atmosphere cycles, climate and sustainability, meteorology, or physics of the hydrosphere
- It is a multidisciplinary, collaborative programme – incorporating physics, chemistry, forest sciences, geography and geosciences, and environmental sciences
- The education is based on high quality research carried out at the [Institute for Atmospheric and Earth System Research \(INAR\)](#) at University of Helsinki
  - [Master's theses](#) are often related to research projects
  - Real research problems can also be found in course tasks

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- ATM-MP is a joint programme of Faculty of Science and Faculty of Agriculture and Forestry (INAR spans across faculties)
- The teaching is carried out at two campuses, Kumpula (Faculty of Science) and Viikki (Faculty of Agriculture and Forestry)





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# ATM-MP study tracks

Study track	Main responsible unit	Important contribution
Atmospheric chemistry and aerosol physics	INAR Physics + Chemistry	
Biosphere-atmosphere cycles	INAR Forest sciences	INAR Physics; Environmental sciences
Climate and Sustainability	INAR Physics	INAR Forest sciences
Physics of the hydrosphere	INAR Physics	
Meteorology	INAR Physics	

- During the application process you need to select a study track
- Changes between the study tracks are possible during your study
- While considering which study track to choose, please review what [knowledge is needed \(prerequisite studies\)](#) to succeed in each of study tracks



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# Study tracks; what will you learn

- **Atmospheric Chemistry & Aerosol Physics** trains specialists who can explain and quantify the chemical and physical processes that shape the Earth's atmosphere—from molecular reactions to global climate feedbacks
- **Biosphere-Atmosphere Cycles** studies the processes involved in cycling of elements in terrestrial and aquatic ecosystems by integrating physics, meteorology, geophysics, chemistry, geology and biology
- **Climate and Sustainability** study track aims on providing students a comprehensive education linking scientific understanding of the climate system and human activities to the implications for sustainable development
- **Meteorology** is the physics of the atmosphere. Its best-known application is weather forecasting, but it is also essential for understanding, predicting and mitigating climate change
- **Physics of the Hydrosphere** studies water in all of its forms using physical methods. It includes hydrology, cryology, and physical oceanography



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# Prerequisite studies

Overall, a good knowledge of bachelor's-level physics and mathematical methods is beneficial for all study tracks, and practical skills in scientific computing (e.g., Python) are also recommended. For a complete list of recommended previous studies see [recommended prerequisites](#)

**Atmospheric Chemistry and Aerosol Physics:** FYS2071 Aerosol Physics (additionally recommended: FYS2001 Basics of Thermophysics and FYS2002 Thermodynamic Potentials or KEK203 Termodynamiikka ja dynamiikka)

if you are interested in Chemistry (recommended KEK101 Atomit, molekyylit ja vuorovaikutukset; KEK102 Orgaaninen kemia 1; KEK103 Energia, reaktiivisuus ja kemiallinen tasapaino; KEK201 Molekyylien rakenne ja spektroskopia)

- **Biosphere-Atmosphere Cycles:** no separate prerequisites (Recommended: FYS2001 Basics of Thermophysics and FYS2002 Thermodynamic Potentials, as well as basic courses in Chemistry and/or Forest Sciences)

# Prerequisite studies

- **Climate and sustainability:** no separate prerequisites
- **Meteorology:** FYS2031 Introduction to Meteorology and Weather Observations, FYS2032 Atmospheric Thermodynamics, FYS2033 Introduction to Atmospheric Flow Dynamics, FYS2034 Introduction to Climatology, and FYS2035 Physical Climatology
- **Physics of the Hydrosphere:** FYS2075 Basic Course in Oceanography, FYS2076 Basic Course in Hydrology (recommended: FYS2032 Ilmakehän termodynamiikka; FYS2033 Ilmakehän virtausdynamiikan perusteet; FYS2073 Virtausilmiöt )



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# Where are our alumni now?

Graduating from the Master's Programme in Meteorology, Atmospheric and Climate-System Sciences, you will have a strong background for working with environmental issues and the ability to find innovative solutions to complex problems in the field of environmental sciences, climate change and weather forecasting.

Graduates of the programme have found employment in Meteorological Institutes and Environmental Administration in Finland and other countries, companies manufacturing instrumentation for atmospheric and environmental measurements and analysis, and consultancy companies.

**Finnish organisations:** Ilmatieteen laitos, Kärnä, Vaisala, Arbonaut, Luonnonvarakeskus (LUKE), Metsähallitus, Sitowise, Foreca, ICEYE, Helsingin yliopisto, Aalto yliopisto, Itä-Suomen yliopisto, Jyväskylän yliopisto, YLE (TV meteorologist), MTV (TV meteorologist)

**International organizations:** Bioréa, WindSim, UK Research and Innovation (UKRI), Stockholm University, Norwegian University of Science and Technology (NTNU), University of Manchester, University of Texas at Austin, University of Hamburg, Australian National University, ETH Zürich, Swedish Meteorological and Hydrological Institute, Icelandic Meteorological Office, UK Met Office, Max Planck Institute for Meteorology