

Joni-Pekka PIETIKÄINEN

Curriculum vitae

Contact information

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Current position and research interests

01.07.2019 - PRESENT:	Postdoctoral researcher Helmholtz-Zentrum Geesthacht – Zentrum für Material- und Küstenforschung GmbH (HZG) Climate Service Center Germany
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I am developing and using the REgional climate MOdel REMO within various topics. In recent years, my research has been focusing on clouds, aerosol particles and lake-atmosphere interactions. My current tasks and research interests are focused around the non-hydrostatic version (high-resolution) of REMO and technical aspects of the code, e.g. parallel GPU programming.

Education and degrees awarded

PH.D. (PHYSICS)	25.03.2015, University of Eastern Finland Thesis title: <i>Aerosols and climate: from regional to global modelling</i>
M.Sc. (PHYSICS)	13.02.2006, University of Kuopio (nowadays University of Eastern Finland) Thesis title: <i>Modelling nitric acid condensation in multi-phase clouds</i> (in Finnish) Grade: excellent

Awards, prizes and honours

2017	Finnish Association for Aerosol Research (FAAR) PhD award for excellent work in aerosol science
2007	Best master's thesis, given by: The Finnish association for mathematicians, physicists, and computer scientists

Other education and training, qualifications and skills

Additional skills

I have extensive skills in numerical modelling of the atmosphere on global and especially in regional scales as well as in managing large data sets. My computing skills include programming languages such as Fortran, Python, Matlab, CDO, shell scripting and writing webpages (HTML). I am also familiar with many types of supercomputer systems and can code parallel programs for normal desktop PC's and supercomputers.

Previous work experience

01.01.2018 - 16.06.2019	Group leader: Seasonal and Climate Applications Finnish Meteorological Institute, Helsinki, Finland <i>Position involved planning and executing seasonal and sub-seasonal forecasting strategies; and leading and coordinating the group's activities, for example, in Copernicus Climate Change Service (C3S), European Research Area for Climate Services (ERA4CS) and Pan-Arctic Regional Climate Outlook Forum (PARCOF), preparing project proposals, conducting my own research on regional and global scales and supervising students</i>
01.01.2015 - 31.12.2017	Senior research scientist, Finnish Meteorological Institute, Helsinki, Finland <i>I was in charge of the regional model development (REMO) and supervised the new model structure implementation (HARMONIE-Climate)</i>
01.03.2011 - 31.12.2014	Researcher / Ph.D. student, Finnish Meteorological Institute, Helsinki, Finland <i>I was the main REMO developer and was focusing on global and regional scale atmosphere-aerosol interactions</i>
01.03.2008 - 28.02.2011	Ph.D. student, Max Planck Institute for Meteorology, Hamburg, Germany <i>My main tasks was to implement the Hamburg aerosol model HAM to regional model REMO. Moreover, my tasks involved heavily model development</i>

01.11.2006 - 29.02.2008	Researcher / Ph.D. student, University of Kuopio, Finland <i>Aerosol-cloud microphysical modelling</i>
01.07.2006 - 31.10.2006	Researcher / Ph.D. student, University of Helsinki, Finland <i>Aerosol-cloud microphysical modelling</i>
01.03.2006 - 30.06.2006	Researcher / Ph.D. student, University of Kuopio, Finland <i>Aerosol-cloud microphysical modelling</i>
01.07.2005 - 28.02.2006	University trainee, University of Kuopio, Finland <i>Aerosol-cloud microphysical modelling</i>
01.01.2005 - 30.06.2005	University trainee, Scholarship, University of Kuopio, Finland <i>Aerosol-cloud microphysical modelling</i>
01.12.2004 - 31.12.2004	University trainee, University of Kuopio, Finland <i>Aerosol-cloud microphysical modelling</i>
01.06.2004 - 31.08.2004	University trainee (data analysis), University of Kuopio, Finland <i>Aerosol data-analysis using self-organizing maps</i>
01.06.2003 - 31.08.2003	University trainee (aerosol measurements), University of Kuopio, Finland <i>Aerosol measurements and data-analysis</i>

Linguistic skills

FINNISH	Native or bilingual proficiency	ENGLISH	Full professional proficiency
GERMAN	Limited working proficiency	UKRAINIAN	Elementary proficiency
SWEDISH	Elementary proficiency		

Publications (Jul-2019)

Scientific peer-reviewed publications:

- Rontu, L., **Pietikäinen, J.-P.**, and Martin Perez, D.: Renewal of aerosol data for ALADIN-HIRLAM radiation parametrizations, *Adv. Sci. Res.*, 16, 129-136, <https://doi.org/10.5194/asr-16-129-2019>, 2019.
- Hooda, R. K., Kivekäs, N., O'Connor, E. J., Collaud Coen, M., **Pietikäinen, J.-P.**, Vakkari, V., Backman, J., Henriksson, S. V., Asmi, E., Komppula, M., Korhonen, H., Hyvärinen, A.P. and Lihavainen, H. (2018). Driving factors of aerosol properties over the foothills of central Himalayas based on 8.5 years continuous measurements. *Journal of Geophysical Research: Atmospheres*, 123, 13,421–13,442. <https://doi.org/10.1029/2018JD029744>
- **Pietikäinen, J.-P.**, Markkanen, T., Sieck, K., Jacob, D., Korhonen, J., Räisänen, P., Gao, Y., Ahola, J., Korhonen, H., Laaksonen, A., and Kaurola, J.: The regional climate model REMO (v2015) coupled with the 1-D freshwater lake model FLake (v1): Fenno-Scandinavian climate and lakes, *Geosci. Model Dev.*, 11, 1321-1342, <https://doi.org/10.5194/gmd-11-1321-2018>, 2018.
- Matt, F. N., Burkhart, J. F., and **Pietikäinen, J.-P.**: Modelling hydrologic impacts of light absorbing aerosol deposition on snow at the catchment scale, *Hydrol. Earth Syst. Sci.*, 22, 179-201, <https://doi.org/10.5194/hess-22-179-2018>, 2018.
- Hienola, A., Partanen, A.-I., **Pietikäinen, J.-P.**, O'Donnell, Korhonen, H., Matthews, H. D., and Laaksonen, A.: The impact of aerosol emissions on the 1.5 °C pathways, *Environ. Res. Lett.*, 13, 044011, doi:10.1088/1748-9326/aab1b2, 2018.
- Hienola, A., O'Donnell, D., **Pietikäinen, J.-P.**, Svensson, J., Lihavainen, H., Virkkula, A., Korhonen, H., and Laaksonen, A.: The radiative impact of Nordic anthropogenic black carbon. *Tellus B*, 68. doi:<http://dx.doi.org/10.3402/tellusb.v68.27428>, 2016
- **Pietikäinen, J.-P.**, Kupiainen, K., Klimont, Z., Makkonen, R., Korhonen, H., Karinkanta, R., Hyvärinen, A.-P., Karvosenoja, N., Laaksonen, A., Lihavainen, H., and Kerminen, V.-M.: Impacts of emission reductions on aerosol radiative effects, *Atmos. Chem. Phys.*, 15, 5501-5519, doi:10.5194/acp-15-5501-2015, 2015.
- Gao, Y., Weiher, S., Markkanen, T., **Pietikäinen, J.-P.**, Gregow, H., Henttonen, H. M., Jacob, D., and Laaksonen, A.: Implementation of the CORINE land use classification in the regional climate model REMO, *Boreal Environ. Res.*, 20: 261-282, 2015.
- **Pietikäinen, J.-P.**, Mikkonen, S., Hamed, A., Hienola, A. I., Birmili, W., Kulmala, M., and Laaksonen, A.: Analysis of nucleation events in the European boundary layer using the regional aerosol-climate model REMO-HAM with a solar radiation-driven OH-proxy, *Atmos. Chem. Phys.*, 14, 11711-11729, doi:10.5194/acp-14-11711-2014, 2014.

- Henriksson, S. V., **Pietikäinen, J.-P.**, Hyvärinen, A.-P., Räisänen, P., Kupiainen, K., Tonttila, J., Hooda, R., Lihavainen, H., O'Donnell, D., Backman, L., Klimont, Z., and Laaksonen, A.: Spatial distributions and seasonal cycles of aerosol climate effects in India seen in a global climate–aerosol model, *Atmos. Chem. Phys.*, 14, 10177-10192, doi:10.5194/acp-14-10177-2014, 2014.
- Gao, Y., Markkanen, T., Backman, L., Henttonen, H. M., **Pietikäinen, J.-P.**, Mäkelä, H. M., and Laaksonen, A.: Biogeophysical impacts of peatland forestation on regional climate changes in Finland, *Biogeosciences*, 11, 7251-7267, doi:10.5194/bg-11-7251-2014, 2014.
- Partanen, A. I., Laakso, A., Schmidt, A., Kokkola, H., Kuokkanen, T., **Pietikäinen, J.-P.**, Kerminen, V.-M., Lehtinen, K. E. J., Laakso, L., and Korhonen, H.: Climate and air quality trade-offs in altering ship fuel sulfur content. *Atmos. Chem. Phys.*, 13, 12059-12071, doi:10.5194/acp-13-12059-2013, 2013.
- Hienola, A. I., **Pietikäinen, J.-P.**, Jacob, D., Pozdun, R., Petäjä, T., Hyvärinen, A.-P., Sogacheva, L., Kerminen, V.-M., Kulmala, M., and Laaksonen, A.: Black carbon concentration and deposition estimations in Finland by the regional aerosol–climate model REMO-HAM. *Atmos. Chem. Phys.*, 13, 4033-4055, doi:10.5194/acp-13-4033-2013, 2013.
- **Pietikäinen, J.-P.**, O'Donnell, D., Teichmann, C., Karstens, U., Pfeifer, S., Kazil, J., Podzun, R., Fiedler, S., Kokkola, H., Birmili, W., O'Dowd, C., Baltensperger, U., Weingartner, E., Gehrig, R., Spindler, G., Kulmala, M., Feichter, J., Jacob, D. and Laaksonen, A.: The regional aerosol-climate model REMO-HAM, 5, 1323-1339, doi:10.5194/gmd-5-1323-2012, 2012.

Scientific publications under review:

- Toivonen, E., Hippä, M., Korhonen, H., Laaksonen, A., Kangas, M., and **Pietikäinen, J.-P.**: The road weather model RoadSurf driven by the HARMONIE-Climate regional climate model: evaluation over Finland, *Geosci. Model Dev. Discuss.*, <https://doi.org/10.5194/gmd-2018-330>, in review, 2019.
- Belušić, D., de Vries, H., Dobler, A., Landgren, O., Lind, P., Lindstedt, D., Pedersen, R. A., Sánchez-Perrino, J. C., Toivonen, E., van Ulft, B., Wang, F., Andrae, U., Batrak, Y., Kjellström, E., Lenderink, G., Nikulin, G., **Pietikäinen, J.-P.**, Rodríguez-Camino, E., Samuelsson, P., van Meijgaard, E., and Wu, M.: HCLIM38: A flexible regional climate model applicable for different climate zones from coarse to convection permitting scales, *Geosci. Model Dev. Discuss.*, <https://doi.org/10.5194/gmd-2019-151>, in review, 2019.

Theses:

- **Pietikäinen, J.-P.**: Aerosols and climate: from regional to global modelling (Fin: Aerosolit ja ilmasto: alueellisesta mallinnuksesta globaaliin mallinnukseen), Ph.D. thesis, University of Eastern Finland, Finnish Meteorological Institute Contributions, no. 114, PhD thesis, Unigrafia Oy, 2015.
- **Pietikäinen, J.-P.**: Typpihapon tiivistyminen kiinteisiin ja nestemäisiin aerosolihiukkasiin (Eng: Modelling nitric acid condensation in multi-phase clouds), Master's Thesis, University of Kuopio, Finland, 2006.

Other publications (e.g. conference abstracts):

- **Pietikäinen, J.-P.**, Vainio, J., Laurila, T. and Gregow, H.: Evaluating the extended-range ice cover forecast over the Northern Baltic Sea. EMS Annual Meeting: European Conference for Applied Meteorology and Climatology 2018 | 3–7 September 2018 | Budapest, Hungary.
- Hooda, R., Hyvärinen, A., Kivekäs, N., **Pietikäinen, J.-P.**, Backman, J., Komppula, M., Lihavainen, H.: Driving factors for aerosol decadal variability at a background station of 2180m altitude. European Aerosol Conference, 4.-9.9.2016, Tours, France.
- Matt F., Burkhart, J. and **Pietikäinen, J.-P.**: Hydrological response to Black Carbon deposition in seasonally snow covered catchments in Norway using two different atmospheric transport models. AGU Fall Meeting, San Francisco, California, 14 December - 18 December 2015.
- **Pietikäinen, J.-P.**, Mikkonen, S., Hamed, A., Hienola, A. I., Birmili, W., Kulmala, M., and Laaksonen, A.: Analysis of nucleation events in the European boundary layer using the regional aerosol-climate model REMO-HAM. 3rd International Lund Regional-Scale Climate Modelling Workshop: 21st Century Challenges in Regional Climate Modelling Lund, Sweden, 16-19 June 2014, International Baltic Earth Secretariat Publication No. 3, 2014.
- Remedio, A.R., Teichmann, C., **Pietikäinen, J.-P.**, Sudarchikova, N., Jacob, D. and Brasseur, G.: Impacts of aerosols in the CORDEX-Europe domain using the regional aerosol-climate model REMO-HAM. 3rd International Lund Regional-Scale Climate Modelling Workshop: 21st Century Challenges in Regional Climate Modelling Lund, Sweden, 16-19 June 2014, International Baltic Earth Secretariat Publication No. 3, 2014.

- Gao, Y., Markkanen, T., Backman, L., Henttonen, H.M., **Pietikäinen, J.-P.** and Laaksonen, A.: Impacts of peatland forestation on regional climate conditions in Finland. EGU2014-6348, EGU General Assembly 2014, 2014.
- Markkanen T., Susiluoto J., Thum T., **Pietikäinen, J.-P.**, Gao Y., Mäkelä J., Kämäräinen M., Rätty O., Räisänen J., Arslan A. and Aalto T.: Driving a Land Surface Scheme with Regional Climate Model Data. In: Kulmala, M., Lintunen, A. and Kontkanen J. (Eds.), Proceedings of FCoE in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change, Annual Meeting 2014, Report Series in Aerosol Science, 157, 437-442, 2014.
- Lihavainen, H., Kerminen, V.-M., Kupiainen, K., Hyvärinen, A.-P., Petäjä, T., Tolonen-Kivimäki, O., Virkkula, A., Karvosenoja, N., Savolahti, M., **Pietikäinen, J.-P.** and Zbigniew, K.: Mitigation of Arctic Warming by Controlling European Black Carbon Emissions, International Aerosol Conference (IAC2014), Busan, South Korea, 2014.
- **Pietikäinen, J.-P.**, Kupiainen, K., Klimont, Z., Hyvärinen, A.-P., Laaksonen, A. and Lihavainen, H.: Mitigation of Arctic warming by controlling European black carbon emissions (MACEB): modelling results, European Aerosol Conference (EAC2013), Prague, Czech Republic, 2013.
- Hienola, A., **Pietikäinen, J.-P.**, O'Donnell, D., Saarnio, K. and Laaksonen, A.: Black carbon and organic carbon in Finland: Measurements vs. model, European Aerosol Conference (EAC2013), Prague, Czech Republic, 2013.
- **Pietikäinen, J.-P.**, Mikkonen, S., and Laaksonen, A.: Nucleation studies with regional aerosol-climate model REMO-HAM, European Aerosol Conference (EAC2012), Granada, Spain, 2012.
- Hienola A. I., **Pietikäinen, J.-P.**, Hyvärinen, A.P., Lihavainen H. and Laaksonen, A.: Evaluation of black carbon estimations by the regional aerosol-climate model REMO-HAM, European Aerosol Conference (EAC2012), Granada, Spain, 2012.
- Hyvärinen A., Henriksson S., Räisänen P., **Pietikäinen, J.-P.**, Hooda R. K., Laaksonen A. and Lihavainen H.: Aerosol Black Carbon In The Indo-Gangetic Plains And In The Foothills Of Himalayas, Measurements Vs. Global Modeling 2012 Fall Meeting, AGU, San Francisco, Calif., United States, 3-7 December, 2012.
- **Pietikäinen, J.-P.**, O'Donnell, D., Kulmala, M., Jacob, D. and Laaksonen, A.: Model comparison between global and regional climate-aerosol models ECHAM5-HAM and REMO-HAM: European aerosols, European Aerosol Conference EAC 2011, Manchester, United Kingdom, 2011.
- Hienola A., **Pietikäinen, J.-P.** Hyvärinen, A.-P., Lihavainen, H., and Laaksonen A.: Using black carbon measurements for evaluating the regional aerosol-climate model REMO-HAM, NOSA 2011, Nordic Aerosol Symposium, Tampere, Finland, November 9-11, pp 29, 2011.
- Kokkola H., Korhonen H., Makkonen R., **Pietikäinen, J.-P.**, Bergman T., Prisle N., Topping D., Hienola A., Henriksson S., Tonttila J., Räisänen P., Laaksonen A., Lehtinen K., Kerminen V.-M., Laukkanen E. and Kulmala M.: Activities using ECHAM-HAM & REMO-HAM in Finland, 5th HAMMOZ workshop, Zurich, Switzerland, 21-22.3, 2011.
- **Pietikäinen, J.-P.**, Laaksonen, A. and Jacob, D.: Aerosols, clouds and precipitation in REMO: a case study, International Aerosol Conference IAC 2010, Helsinki, Finland, 2010.
- Romakkaniemi S., Kokkola H., **Pietikäinen, J.-P.**, Hienola J., Kulmala M., Lehtinen K.E.J. and Laaksonen A.: Microphysics of ice particle and cloud droplet formation: Effect of semivolatile gases, Proceedings of the Nordic Center of Excellence BACCI (Biosphere-Atmosphere-Cloud-Climate Interactions) and the Finnish Center of Excellence 'Research Unit on Physics, Chemistry and Biology of Atmospheric Composition and Climate Change' Activities in 2002-2007, Editors: Markku Kulmala, Jaana Bäck and Martta Salonen, 205-209, 2008.
- **Pietikäinen, J.-P.**, Hienola, J., Kokkola, H., Romakkaniemi, S., Lehtinen, K. E. J., Kulmala, M. and Laaksonen A.: Modeling nitric acid adsorption in mixed-phase clouds, European Aerosol Conference EAC 2007, Salzburg, Austria, 2007.
- **Pietikäinen, J.-P.**, Hienola, J., Kokkola, H., Romakkaniemi, S., Lehtinen, K. E. J., Kulmala, M. and Laaksonen A.: Model Studies Of Nitric Acid Condensation In Mixed-Phase Clouds, O'Dowd CD, Wagner PE, eds. Nucleation and Atmospheric Aerosols, 17th International Conference, ICNAA, Galway, Ireland, p. 596-600, Springer, 2007.
- **Pietikäinen, J.-P.**, Hienola, J., Kokkola, H., Romakkaniemi, S., Lehtinen, K.E.J. and Laaksonen A.: Model studies of nitric acid condensation in mixed-phase clouds, NOSA Aerosol Symposium, combined with the X Finnish National Aerosol Symposium, Finnish-Czech Aerosol Symposium, and BACCI workshop, Helsinki, Finland, 2006.

- **Pietikäinen, J.-P.**, Hienola, J., Kokkola, H., Romakkaniemi, S. and Laaksonen A.: Modeling nitric acid condensation in mixed-phase clouds, Atmospheric Chemistry at the Interfaces, Joint IGAC/CACGP/WMO Symposium, Cape Town, South Africa, 2006.
- **Pietikäinen, J.-P.**, Hienola, J., Kokkola, H., Romakkaniemi, S. and Laaksonen, A.: Modeling nitric acid condensation in mixed-phase clouds, Proceedings of BACCI, NECC and FCoE activities, 2005.
- **Pietikäinen, J.-P.**, Kokkola, H., Romakkaniemi, S. and Laaksonen, A.: Model simulations of CCN counter measurements, BACCI Workshop, Kuopio, Finland, 2005.