

Janne Levula  
Ecosystem processes (INAR Forest Sciences)

## Employment

Ecosystem processes (INAR Forest Sciences)

University of Helsinki  
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1 Jan 2005 → present

## Research outputs

### Measurement report: Introduction to the HyLCE-2018 campaign for measurements of ice-nucleating particles and instrument inter-comparison in the Hyttiala boreal forest

Brasseur, Z., Castarede, D., Thomson, E. S., Adams, M. P., Drossaart van Dusseldorf, S., Heikkilä, P., Korhonen, K., Lampilahti, J., Paramonov, M., Schneider, J., Vogel, F., Wu, Y., Abbatt, J. P. D., Atanasova, N. S., Bamford, D. H., Bertozi, B., Boyer, M., Brus, D., Daily, M. I., Fösig, R., & 25 othersGute, E., Harrison, A. D., Hietala, P., Höhler, K., Kanji, Z. A., Keskinen, J., Lacher, L., Lampimäki, M., Levula, J., Manninen, A., Nadolny, J., Peltola, M., Porter, G. C. E., Poutanen, P., Proske, U., Schorr, T., Silas Umo, N., Stenszky, J., Virtanen, A., Moisseev, D., Kulmala, M., Murray, B. J., Petäjä, T., Möhler, O. & Duplissy, J., 19 Apr 2022, In: Atmospheric Chemistry and Physics. 22, 8, p. 5117-5145 29 p.

### Terpene emissions from boreal wetlands can initiate stronger atmospheric new particle formation than boreal forests

Junninen, H., Ahonen, L., Bianchi, F., Quelever, L., Schallhart, S., Dada, L., Manninen, H. E., Leino, K., Lampilahti, J., Mazon, S. B., Rantala, P., Räty, M., Kontkanen, J., Negri, S., Aliaga, D., Garmash, O., Alekseychik, P., Lipp, H., Tamme, K., Levula, J., & 10 othersSipilä, M., Ehn, M., Worsnop, D., Zilitinkevich, S., Mammarella, I., Rinne, J., Vesala, T., Petäjä, T., Kerminen, V-M. & Kulmala, M., 19 Apr 2022, In: Communications earth & environment. 3, 1, 9 p., 93.

### Influence of biogenic emissions from boreal forests on aerosol-cloud interactions

Petäjä, T., Tabakova, K., Manninen, A., Ezhova, E., O'Connor, E., Moisseev, D., Sinclair, V., Backman, J., Levula, J., Luoma, K., Virkkula, A., Paramonov, M., Räty, M., Äijälä, M., Heikkilä, L., Ehn, M., Sipilä, M., Yli-Juuti, T., Virtanen, A., Ritsche, M., & 7 othersHickmon, N., Pulik, G., Rosenfeld, D., Worsnop, D., Back, J., Kulmala, M. & Kerminen, V-M., Jan 2022, In: Nature Geoscience. 15, 1, p. 42-+ 18 p.

### Zeppelin-led study on the onset of new particle formation in the planetary boundary layer

Lampilahti, J., Manninen, H. E., Nieminen, T., Mirme, S., Ehn, M., Pullinen, I., Leino, K., Schobesberger, S., Kangasluoma, J., Kontkanen, J., Järvinen, E. P., Väänänen, R., Yli-Juuti, T., Krejci, R., Lehtipalo, K., Levula, J., Mirme, A., Decesari, S., Tillmann, R., Worsnop, D. R., & 6 othersRohrer, F., Kiendler-Scharr, A., Petäjä, T., Kerminen, V-M., Mentel, T. F. & Kulmala, M., 26 Aug 2021, In: Atmospheric Chemistry and Physics. 21, 16, p. 12649-12663 15 p.

### Evaluation and optimization of ICOS atmosphere station data as part of the labeling process

Yver-Kwok, C., Philippon, C., Bergamaschi, P., Biermann, T., Calzolari, F., Chen, H., Conil, S., Cristofanelli, P., Delmotte, M., Hatakka, J., Heliasz, M., Hermansen, O., Kominkova, K., Kubistin, D., Kumps, N., Laurent, O., Laurila, T., Lehner, I., Levula, J., Lindauer, M., & 15 othersLopez, M., Mammarella, I., Manca, G., Marklund, P., Metzger, J-M., Mölder, M., Platt, S. M., Ramonet, M., Rivier, L., Scheeren, B., Sha, M. K., Smith, P., Steinbacher, M., Vitkova, G. & Wyss, S., 5 Jan 2021, In: Atmospheric Measurement Techniques. 14, 1, p. 89-116 28 p.

### Long-term aerosol mass concentrations in southern Finland: instrument validation, seasonal variation and trends

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### Radical Formation by Fine Particulate Matter Associated with Highly Oxygenated Molecules

Tong, H., Zhang, Y., Filippi, A., Wang, T., Li, C., Liu, F., Leppa, D., Kourtchev, I., Wang, K., Keskinen, H.-M., Levula, J. T., Arangio, A. M., Shen, F., Ditas, F., Martin, S. T., Artaxo, P., Godoi, R. H. M., Yamamoto, C. I., de Souza, R. A. F., Huang, R.-J., & 15 othersBerkemeier, T., Wang, Y., Su, H., Cheng, Y., Pope, F. D., Fu, P., Yao, M., Pöhlker, C., Petaja, T., Kulmala, M., Andreae, M. O., Shiraiwa, M., Pöschl, U., Hoffmann, T. & Kalberer, M., 5 Nov 2019, In: Environmental Science & Technology. 53, 21, p. 12506-12518 13 p.

**Diurnal and Seasonal Solar Induced Chlorophyll Fluorescence and Photosynthesis in a Boreal Scots Pine Canopy**

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**Methane budget estimates in Finland from the CarbonTracker Europe-CH4 data assimilation system**

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**Soil fluxes of carbonyl sulfide (COS), carbon monoxide, and carbon dioxide in a boreal forest in southern Finland**

Sun, W., Kooijmans, L. M. J., Maseyk, K., Chen, H., Mammarella, I., Vesala, T., Levula, J., Keskinen, H. & Seibt, U., 1 Feb 2018, In: *Atmospheric Chemistry and Physics*. 18, 2, p. 1363-1378 16 p.

**Solar eclipse demonstrating the importance of photochemistry in new particle formation**

Jokinen, T., Kontkanen, J., Lehtipalo, K., Manninen, H. E., Aalto, J., Porcar-Castell, A., Garmash, O., Nieminen, T., Ehn, M., Kangasluoma, J., Junninen, H., Levula, J., Duplissy, J., Ahonen, L. R., Rantala, P., Heikkilä, L., Yan, C., Sipila, M., Worsnop, D. R., Back, J., & 3 othersPetäjä, T., Kerminen, V.-M. & Kulmala, M., 4 Apr 2017, In: *Scientific Reports*. 7, 5 p., 45707.

**Detecting Inter-Annual Variations in the Phenology of Evergreen Conifers Using Long-Term MODIS Vegetation Index Time Series**

Ulsig, L., Nichol, C. J., Huemmrich, K. F., Landis, D. R., Middleton, E. M., Lyapustin, A. I., Mammarella, I., Levula, J. & Porcar-Castell, A., Jan 2017, In: *Remote Sensing*. 9, 1, 21 p., 49.

**BAECC: A Field Campaign to Elucidate the Impact of Biogenic Aerosols on Clouds and Climate**

Petäjä, T., O'Connor, E. J., Moisseev, D., Sinclair, V. A., Manninen, A. J., Väätänen, R., von Lerber, A., Thornton, J. A., Nicoll, K., Petersen, W., Venkatachalam, C., Smith, J. N., Winkler, P. M., Krüger, O., Hakola, H., Timonen, H., Brus, D., Laurila, T., Asmi, E., Riekola, M-L., & 11 othersMona, L., Massoli, P., Engelmann, R., Komppula, M., Wang, J., Kuang, C., Bäck, J., Virtanen, A., Levula, J., Ritsche, M. & Hickmon, N., 22 Nov 2016, In: *Bulletin of the American Meteorological Society*. 97, 10, p. 1909-1928 20 p.

**Enhanced Volatile Organic Compounds emissions and organic aerosol mass increase the oligomer content of atmospheric aerosols**

Kourtchev, I., Giorio, C., Manninen, A. J., Wilson, E., Mahon, B., Aalto, J., Kajos, M., Venables, D., Ruuskanen, T., Levula, J., Loponen, M., Connors, S., Harris, N., Zhao, D., Kiendler-Scharr, A., Mentel, T., Rudich, Y., Hallquist, M., Doussin, J.-F., Maenhaut, W., & 5 othersBäck, J., Petäjä, T., Wenger, J., Kulmala, M. & Kalberer, M., 13 Oct 2016, In: *Scientific Reports*. 6, 9 p., 35038.

**Intra-annual variability of wood formation and delta C-13 in tree-rings at Hytylä, Finland**

Soudant, A., Loader, N. J., Bäck, J., Levula, J. & Kljun, N., 15 Aug 2016, In: *Agricultural and Forest Meteorology*. 224, p. 17-29 13 p.

**Airborne measurements of small clusters and air ions.**

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**Climatic controls on leaf litter decomposition across European forests and grasslands revealed by reciprocal litter transplantation experiments**

Portillo-Estrada, M., Pihlatie, M., Korhonen, J. F. J., Levula, J., Frumau, A. K. F., Ibrom, A., Lembrechts, J. J., Morillas, L., Horvath, L., Jones, S. K. & Niinemets, U., 2016, In: *Biogeosciences*. 13, 5, p. 1621-1633 13 p.

**Carbon dioxide and energy fluxes over a small boreal lake in Southern Finland**

Mammarella, I., Nordbo, A., Rannik, U., Haapanala, S., Levula, J., Laakso, H., Ojala, A., Peltola, O., Heiskanen, J., Pumpanen, J. & Vesala, T., Jul 2015, In: *Journal of Geophysical Research : Biogeosciences*. 120, 7, p. 1296-1314 19 p.

**Mobile ground-based measurements of aerosol and trace gases during a prescribed burning experiment in boreal forest in Finland**

Pirjola, L., Virkkula, A., Petäjä, T., Levula, J., Kukkonen, J. & Kulmala, M., 27 Feb 2015, In: Boreal Environment Research. 20, 1, p. 105-119 15 p.

**Interpreting canopy development and physiology using a European phenology camera network at flux sites**

Wingate, L., Ogee, J., Cremonese, E., Filippa, G., Mizunuma, T., Migliavacca, M., Moisy, C., Wilkinson, M., Moreaux, C., Wohlfahrt, G., Hammerle, A., Hoertnagl, L., Gimeno, C., Porcar-Castell, A., Galvagno, M., Nakaji, T., Morison, J., Kolle, O., Knohl, A., Kutsch, W., & 27 othersKolari, P., Nikinmaa, E., Ibrom, A., Gielen, B., Eugster, W., Balzarolo, M., Papale, D., Klumpp, K., Koestner, B., Gruenwald, T., Joffre, R., Ourcival, J. -M., Hellstrom, M., Lindroth, A., George, C., Longdoz, B., Genty, B., Levula, J., Heinesch, B., Sprintsin, M., Yakir, D., Manise, T., Guyon, D., Ahrends, H., Plaza-Aguilar, A., Guan, J. H. & Grace, J., 2015, In: Biogeosciences. 12, 20, p. 5995-6015 21 p.

**Interpreting canopy development and physiology using the EUROPhen camera network at flux sites**

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**Towards a more comprehensive understanding of lacustrine greenhouse gas dynamics - two-year measurements of concentrations and fluxes of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O in a typical boreal lake surrounded by managed forests**

Miettinen, H., Pumpanen, J., Heiskanen, J. J., Aaltonen, H., Mammarella, I., Ojala, A., Levula, J. & Rantakari, M. M., 2015 , In: Boreal Environment Research. 20, 1, p. 75-89 15 p.

**Acidic reaction products of monoterpenes and sesquiterpenes in atmospheric fine particles in a boreal forest**

Vestenius, M., Hellen, H., Levula, J., Kuronen, P., Helminen, K. J., Nieminen, T., Kulmala, M. & Hakola, H., 2014, In: Atmospheric Chemistry and Physics. 14, 15, p. 7883-7893 11 p.

**Applicability of an integrated plume rise model for the dispersion from wild-land fires**

Kukkonen, J., Nikmo, J., Sofiev, M., Riikonen, K., Petäjä, T., Virkkula, A., Levula, J., Schobesberger, S. & Webber, D. M., 2014, In: Geoscientific Model Development. 7, 6, p. 2663-2681 19 p.

**A temperature-controlled spectrometer system for continuous and unattended measurements of canopy spectral radiance and reflectance**

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**Changes in biogeochemistry and carbon fluxes in a boreal forest after the clear-cutting and partial burning of slash**

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**Greenhouse gases and micrometeorology research team: overview of scientific activities**

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**Knowledge transfer of climate-ecosystem-interactions between science and society - Introducing the Climate Whirl concept**

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**Measured and modelled albedos in Finnish boreal forest stands of different species, structure and understory**

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**New foliage growth is a significant, unaccounted source for volatiles in boreal evergreen forests**

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**Prescribed burning of logging slash in the boreal forest of Finland: emissions and effects on meteorological quantities and soil properties**

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**Evidence of lateral transport of carbon gases of terrestrial origin in boreal aquatic ecosystems**

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**Nitrogen balance of a boreal Scots pine forest**

Korhonen, J., Pihlatie, M., Pumpanen, J., Aaltonen, H., Hari, P., Levula, J., Kieloaho, A-J., Nikinmaa, E., Vesala, T. & Ilvesniemi, H., 2013, In: Biogeosciences. 10, p. 1083-1095 13 p.

**Novel viewpoints for the transactions of forests and atmosphere -art/science residence at Hyttiälä 2013-2014**

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**Tree growth measurements at SMEAR II**

Kulmala, L., Aalto, J., Helmisaari, H-S., Kabiri Koupaei, K., Kolari, P., Korhonen, J., Levula, J., Leppälämmi-Kujansuu, J., Mäkinen, H., Schiestl-Aalto, P., Hari, P., Bäck, J., Mäkelä, A. & Nikinmaa, E., 2013, *Proceedings of FCoE in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' Annual Meeting 2013*. p. 310-315 4 p. (Report Series in Aerosol Science; vol. Nro 142 (2013)).

**Seasonal variation in boreal pine forest albedo and effects of canopy snow on forest reflectance**

Kuusinen, N., Kolari, P., Levula, J., Porcar-Castell, A., Stenberg, P. & Berninger, F., 15 Oct 2012, In: Agricultural and Forest Meteorology. 164, p. 53-60 8 p.

**From water-air interfaces to carbon-water cycles**

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**Is forest management a significant source of monoterpenes into the boreal atmosphere?**

Haapanala, S., Hakola, H., Hellen, H., Vestenius, M., Levula, J. & Rinne, J., 2012, In: Biogeosciences. 9, 4, p. 1291–1300 10 p.

**Soil Temperatures during prescribed burning and the occurrence of Rhizina undulata Fr.**

Uotila, A. & Levula, J., 2012, In: Journal of Agricultural Extension and Rural Development. 4, 9, p. 207-210 4 p.

### **CO<sub>2</sub> efflux before and after a clear cut and prescribed burning of a boreal spruce forest**

Kulmala, L., Pumpanen, J., Levula, J., Rantanen, S., Laakso, H., Siivola, E., Kolari, P. & Vesala, T., 2011, *Proceedings of the Finnish Center of Excellence and Graduate School in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' : Annual Workshop 18.–20.5.2011.* p. 184–187 4 p. (Report series in aerosol science; vol. 126).

### **Full nitrogen balance of a boreal Scots pine forest**

Korhonen, J., Pihlatie, M., Pumpanen, J., Levula, J., Hari, P., Nikinmaa, E., Ilvesniemi, H. & Vesala, T., 2011, *Proceedings of the Finnish Center of Excellence and Graduate School in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' Annual Workshop 18.–20.5.2011.* p. 179–180 2 p. (Report series in aerosol science; vol. 126).

### **Is forest management a significant source of monoterpenes into the boreal atmosphere?**

Haapanala, S., Hakola, H., Hellen, H., Vesterius, M., Levula, J. & Rinne, J., 2011, *Proceedings of the Finnish Center of Excellence and Graduate School in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change' Annual Workshop 18.–20.5.2011.* p. 102–107 6 p. (Report series in aerosol science; vol. 126).

### **Is forest management a significant source of terpenoids into boreal atmosphere?**

Haapanala, S., Hakola, H., Hellen, H., Vesterius, M., Levula, J. & Rinne, J., 2011, In: Geophysical Research Abstracts. 13

### **Prescribed forest burning experiment in June 2009**

Virkkula, A. O., Levula, J., Pohja, T., De Leeuw, G., Schultz, D., Clements, C., Kukkonen, K., Nikmo, J., Sofiev, M., Pirjola, L., Kulmala, L., Pumpanen, J., Vesala, T., Kieloaho, A.-J., Aaltonen, H., Pihlatie, M., Häkkinen, S., Manninen, H. E., Junninen, H., Nieminen, T., & 1 othersKulmala, M., 2011, *Proceedings of the Finnish Center of Excellence and Graduate School in 'Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change'.* p. 402–407 6 p. (Report series in aerosol science; vol. 126).

### **The summertime Boreal forest field measurement intensive (HUMPPA-COPEC-2010): an overview of meteorological and chemical influences**

Williams, J., Crowley, J., Fischer, H., Harder, H., Martinez, M., Petaja, T., Rinne, J., Bäck, J., Boy, M., Dal Maso, M., Hakala, J., Kajos, M., Keronen, P., Rantala, P., Aalto, J., Aaltonen, H., Paatero, J., Vesala, T., Hakola, H., Levula, J., & 44 othersPohja, T., Herrmann, F., Auld, J., Mesarchaki, E., Song, W., Yassaa, N., Noelscher, A., Johnson, A. M., Custer, T., Sinha, V., Thieser, J., Pouvesle, N., Taraborrelli, D., Tang, M. J., Bozem, H., Hosaynali-Beygi, Z., Axinte, R., Oswald, R., Novelli, A., Kubistin, D., Hens, K., Javed, U., Trawny, K., Breitenberger, C., Hidalgo, P. J., Ebben, C. J., Geiger, F. M., Corrigan, A. L., Russell, L. M., Ouwersloot, H. G., de Arellano, J. V-G., Ganzeveld, L., Vogel, A., Beck, M., Bayerle, A., Kampf, C. J., Bertelmann, M., Koellner, F., Hoffmann, T., Valverde, J., Gonzalez, D., Riekola, M. -L., Kulmala, M. & Lelieveld, J., 2011, In: Atmospheric Chemistry and Physics. 11, p. 10599–10618 20 p.

### **Long-term measurements of the carbon balance of a boreal Scots pine dominated forest ecosystem**

Ilvesniemi, H., Levula, J., Ojansuu, R., Kolari, P., Kulmala, L., Pumpanen, J., Launiainen, S., Vesala, T. & Nikinmaa, E., 2009, In: Boreal Environment Research. 14, 4, p. 731–753 23 p.

### **The effects of soil preparation treatments on greenhouse gas fluxes in peatland forest regeneration areas**

Pearson, M., Silvan, N., Laine, J., Minkkinen, K., Saarinen, M. & Levula, J., 2008, *Proceedings of the 13th International Peat Congress, After Wise Use – The Future of Peatlands, Tullamore, Ireland 8-13 June 2008: Poster Presentations.* Farrell, C. & Feehan, J. (eds.). International Peat Society, Vol. 2. p. 218–221 4 p.

### **Effect of thinning on surface fluxes in a boreal forest**

Vesala, T., Suni, T., Rannik, Ü., Keronen, P., Markkanen, T., Sevanto, S., Grönholm, T., Smolander, S., Kulmala, M., Ilvesniemi, H., Ojansuu, R., Uotila, A., Levula, J., Mäkelä, A., Pumpanen, J., Kolari, P., Kulmala, L., Altimir, N., Berninger, F., Nikinmaa, E., & 1 othersHari, P., 2 Apr 2005, In: Global Biogeochemical Cycles. 19, p. GB2001 11 p.

## **Projects**

### **Center of Excellence in Physics, Chemistry, Biology and Meteorology of Atmospheric Composition and Climate Change (ATM)**

Aalto, J., Aalto, P., Aaltonen, H., Altimir, N., Arneth, A., Asmi, A., Backman, J., Bister, M., Bonn, B., Boy, M., Bäck, J., Chandrasekar, V., Dal Maso, M., De Leeuw, G., Duursma, R., Ehn, M., Franchin, A., Gagne, S., Göke, S., Haapanala, S., Hari, P., Hartonen, K., Herrmann, E., Hienola, A., Hilasvuori, E., Hussein, T., Hyötyläinen, T., Hämeri, K., Hölttä, T., Julin,

J. D., Junninen, H., Jussila, M., Juurola, E., Järvi, L., Kajos, M., Katul, G., Kerminen, V., Keronen, P., Kieloaho, A., Kolari, P., Korhonen, J., Kulmala, L., Kulmala, M., Kurten, T., Duplissy (née Kyrö), E., Laakso, L., Laitinen, T., Lappalainen, H. K., Launiainen, S., Lauri, K. A., Lauros, J., Lehtipalo, K., Levula, J., Liao, L., Linden, A., Loukonen, V., Makkonen, R., Mammarella, I., Manninen, H., McGrath, M., Merikanto, J., Moisseev, D., Mölgård, B., Mäkelä, A., Määttänen, A. E., Napari, I. I., Nieminen, T., Nikinmaa, E., Nordbo, A., Olascoaga Gracia, B., Ortega Colomer, I., Paasonen, P., Parshintsev, J., Patokoski, J., Perämäki, M. K., Petäjä, T., Pihlatie, M., Pohja, T., Porcar-Castell, A., Pumpanen, J., Raivonen, M., Rannik, U., Rasilo, T., Reissell, A., Riekola, M., Riikonen, A., Riipinen, I., Rinne, J., Riuttanen, L., Ruiz-Jimenez, J., Ruuskanen, T., Ruusuvuori, K., Räisänen, J., Savijärvi, H., Schiestl-Aalto, P., Schobesberger, S., Schultz, D., Sevanto, S., Sipilä, M., Sogacheva, L., Sorvari, S., Sundström, A., Suni, T., Taipale, R., Toivola, M., Tomasic, M., Vakkari, V., Vana, M., Vanhanen, J., Vehkämäki, H., Vesala, T., Virkkula, A. O., Worsnop, D., Vuollekoski, H., Väänänen, R., Yli-Juuti, T., Zilitinkevich, S., Asmi, E., Bogdan, A. & Prisle, N.

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