

PERSONAL INFORMATION

Dr. Daniela Famulari

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Date and place of birth 19/09/1973, Milano | Nationality Italian

WORK EXPERIENCE

September 2014 – present

CNR ISAFOM - Piazzale E. Fermi, 1, Portici (NA) 80055, Italy
C.N.R. Researcher – Environmental Physicist

Public sector research on forest and agricultural ecosystems.

- N₂O, CH₄, NH₃ and CO₂ exchange fluxes at the agricultural ICOS-candidate site Cioffi (SA, IT).
- Measurement of exchange processes between the urban environment and atmosphere of PM, GHG, O₃, NO_x.
- Co-PI of the urban site of San Marcellino (IAUC site) in the city of Naples (IT).
- Impact of chemical waste landfill sites in Southern Italy on atmospheric chemistry and climate.
- Supervision and training of younger staff.

January 2001 – July 2014

NERC - Centre for Ecology and Hydrology, Edinburgh: Bush Estate, Penicuik, EH26 0QB, United Kingdom

Scientific Officer, Researcher – Environmental Physicist

Public sector research centre, part of the Natural Environment Research Council (NERC) of the United Kingdom.

- Long-term acid-deposition data measurements over a peat bog in Scotland, in the context of trans-boundary air pollution.
- Measurements of surface-atmosphere exchange of CO₂, CH₄ from a peatland at Auchencorth Moss (UK) by eddy covariance and enclosure techniques.
- Applied micrometeorology for measuring fluxes (eddy covariance, REA, aerodynamic gradient), in exchange processes between land (for both soil and vegetation) and atmosphere in rural, urban and natural areas, for independent verification of emission inventories.
- LASER absorption spectroscopy (QCLAS, TDLAS) for flux measurements of trace gases: N₂O, NH₃, HNO₃, CH₄.
- Impact of agricultural land management on the natural ecosystems and environment.
- Mitigation of ammonia by trees in the rural environment.
- Preparation and analysis of datasets for databases, model input and validation.
- Supervision of PhD students, younger staff, visiting scientists.
- Coordination of all groups of international field measurement campaign events at the Easter Bush field site (Scotland, UK) for the inter-comparison of new technologies applied to the detection of NH₃ gas and N₂O within EU projects (NEU, InGOS).
- Data set handling, for data submission to several databases, and support work on the LULUCF database.
- Managing work packages within projects involving several colleagues over the years.

March 1999 – July 2000

European Commission Joint Research Centre, Ispra (VA), Italy
Full-time trainee in the Air Quality research group.

Public sector European environmental research centre.

- Micrometeorology (eddy covariance), with programming for calculation of turbulent fluxes of large datasets.
- LASER absorption spectroscopy instrumentation (TDLAS).
- Greenhouse gases.

EDUCATION AND TRAINING

February 2001- June 2006

School of Geosciences, University of Edinburgh and Centre for Ecology and Hydrology (Edinburgh, United Kingdom).
PhD in Atmospheric and Environmental Physics

- Thesis on "The surface-atmosphere exchange of ammonia and sulphur dioxide"
- Micrometeorology (eddy covariance), with programming for calculation of turbulent fluxes of large datasets.
- Development of a new approach for micrometeorological flux measurements of trace gases on a long term basis (COnditional Time Average –COTAG approach)
- Holding workshops for university master students.

October 1992 - June 2000

University of Milan (Italy), Physics Department
Degree in Physics

- Terrestrial and Environmental Physics, with the thesis work on "Seasonal trend of methane fluxes from a rice paddy near Vercelli".

RESEARCH INTERESTS

- Land-Atmosphere interface dynamics of pollutants and GHG: soil and vegetation exchange with the surface layer.
- Sustainability of agriculture for N₂O soil emissions, and N-compounds from fertilisers.
- Impacts on semi-natural ecosystems such as moorlands of long-range transported pollutants.
- Biogeochemical cycles of C-, N- compounds, such as gaseous NH₃, aerosol precursors, GHG and trace gases.
- Mitigation of atmospheric pollution through vegetation (silviculture, agroforestry, buffer semi-natural zones) for preservation of biodiversity.
- Contaminated land impacts.

PERSONAL SKILLS

Languages Italian (mother tongue)
English (proficient user)
French (basic user)

Communication skills Scientific dissemination at public events (local Councils, IT) with local administrators.
Oral and poster presentations at international scientific conferences and meetings.

Academic skills Workshops for university master students and PhD students (University of Edinburgh, UK; Università Cattolica del Sacro Cuore di Brescia, IT).
University lectures as part of seminars (Federico II University of Naples, IT).
Associate editor of *Atmospheric Measurement Techniques* (dec 2019-ongoing)

Job-related technical skills

- LASER absorption spectroscopy (QCLAS, TDLAS)
- Analysis of large data sets, for micrometeorological data (eddy covariance, REA, gradient) and mainly time series analysis on a long term.
- Instrumental and technical troubleshooting of fast analysers of trace gases and particles (OPC, IRGAs, CRD, CPC, photo acoustic NH₃ detector, CO Aerolaser analyser, UHSAS).
- Field site setup for measurement campaigns and maintenance.
- Chemical analysis by conductivity analysis and ion chromatography (AMFIA, IC system)
- Knowledge of meteorological equipment (data logger, ultrasonic anemometers, weather stations, SODAR)
- Soil enclosures, static and dynamic; soil and vegetation standard monitoring equipment.

- Computer skills**
- Good command of Wavemetrics IGOR, for spectroscopy and statistics, data analysis, graphics
 - R programming, intermediate user: for statistical analysis especially on long term datasets, graphics.
 - Good command of Windows, DOS and Unix operating systems
 - Good command of Microsoft Office™ tools
 - Fortran programming, for calculation on large datasets
 - User of National Instruments LabView, for instrument logging and some data analysis
 - Intermediate user of LaTeX for editing.

ADDITIONAL INFORMATION

- Memberships** Royal Meteorological Society, UK.
European Geosciences Union, EGU
- Certifications** Off road 4 wheel driving (used often for field campaigns).
Driving licence (B, E).
Electrical work safety.

PEER REVIEWED PUBLICATIONS

- 2020 Pastorello, G., Trotta, C., Canfora, E., Chu, H., Christianson, D., Cheah, Y. W., ... Famulari, D., ... Papale, D. (2020). The FLUXNET2015 dataset and the ONEFlux processing pipeline for eddy covariance data. *Scientific Data*, 7(1), 225. <https://doi.org/10.1038/s41597-020-0534-3>
- 2020 N. Cowan, P. Levy, J. Maire, M. Coyle, S.R. Leeson, D. Famulari, M. Carozzi, E. Nemitz, U. Skiba (2020) An evaluation of four years of nitrous oxide fluxes after application of ammonium nitrate and urea fertilisers measured using the eddy covariance method. *Agricultural and Forest Meteorology*, Volume 280, 107812, ISSN 0168-1923. <https://doi.org/10.1016/j.agrformet.2019.107812>
- 2019 Gasbarra, D., Toscano, P., Famulari, D., Finardi, S., Di Tommasi, P., Zaldei, A., ... Gioli, B. (2019). Locating and quantifying multiple landfills methane emissions using aircraft data. *Environmental Pollution*, 254, 112987. <https://doi.org/10.1016/j.envpol.2019.112987>
- 2018 Carriero, G., Neri, L., Famulari, D., Di Lonardo, S., Piscitelli, D., Manco, A., ... Baraldi, R. (2018). Composition and emission of VOC from biogas produced by illegally managed waste landfills in Giugliano (Campania, Italy) and potential impact on the local population. *Science of The Total Environment*, 640–641, 377–386. <https://doi.org/10.1016/j.scitotenv.2018.05.318>
- 2017 Finardi, S., Agrillo, G., Baraldi, R., Brusasca, G., Vitale, L., Carriero, G., Ciccioli, P., Di Lonardo, S., Facini, O., Famulari, D., Gasbarra, D., Gioli, B., Neri, L., Magliulo, V., Prandi, R., Tinarelli, G., Toscano, P., Zaldei, A. (2017). Air quality impact of vocs emission from the hazardous waste landfills located in giugliano (NA). In *HARMO 2017 - 18th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes*, Proceedings.
- 2017 Levy, P. E., Cowan, N., van Oijen, M., Famulari, D., Drewer, J., & Skiba, U. (2017). Estimation of cumulative fluxes of nitrous oxide: uncertainty in temporal upscaling and emission factors. *European Journal of Soil Science*, 68(4), 400–411. <https://doi.org/10.1111/ejss.12432>
- 2017 Cowan, N. J., Levy, P. E., Famulari, D., Anderson, M., Reay, D. S., & Skiba, U. M. (2017). Nitrous oxide emission sources from a mixed livestock farm. *Agriculture, Ecosystems and Environment*, 243(March), 92–102. <http://doi.org/10.1016/j.agee.2017.04.014>
- 2017 Jones, S. K., Helfter, C., Anderson, M., Coyle, M., Campbell, C., Famulari, D., Di Marco, C., van Dijk, N., Topp, C. F. E., Kiese, R., Kindler, R., Siemens, J., Schrumpp, M., Kaiser, K., Nemitz, E., Levy, P., Rees, R. M., Sutton, M. A., and Skiba, U. M.: The nitrogen, carbon and greenhouse gas budget of a grazed, cut and fertilised temperate grassland, *Biogeosciences Discuss.*, doi:10.5194/bg-2016-221.
- 2016 Cowan, N. J., Levy, P. E., Famulari, D., Anderson, M., Drewer, J., Carozzi, M., Reay, D. S., and Skiba, U. M.: The influence of tillage on N₂O fluxes from an intensively managed grazed grassland in Scotland, *Biogeosciences* 13, 4811-4821, doi:10.5194/bg-13-4811-2016.
- 2015 Cowan, N. J., Norman, P., Famulari, D., Levy, P. E., Reay, D. S., and Skiba, U. M.: Spatial variability and hotspots of soil N₂O fluxes from intensively grazed grassland, *Biogeosciences*, 12, 1585-1596, doi:10.5194/bg-12-1585-2015.
- 2014 N. J. Cowan, D. Famulari, P. E. Levy, M. Anderson, D. S. Reay, and U. M. Skiba: Investigating uptake of N₂O in agricultural soils using a high-precision dynamic chamber method, *Atmos. Meas. Tech.*, 7, 4455–4462, 2014.
- 2014 W J Bealey, B Loubet, C F Braban, D Famulari, M R Theobald, S Reis, D S Reay and M A Sutton: Modelling agro-forestry scenarios for ammonia abatement in the landscape, *Environmental Research Letters*, Volume 9, Number 12 Focus on Nitrogen Management Challenges: From Global to Local Scales.
- 2014 Cowan, N. J., Famulari, D., Levy, P. E., Anderson, M., Bell, M. J., Rees, R. M., Reay, D. S. and Skiba, U. M. (2014), An improved method for measuring soil N₂O fluxes using a quantum cascade laser with a dynamic chamber. *Eur J Soil Sci*, 65: 643–652. doi:10.1111/ejss.12168.

- 2013 M. Vieno, M. R. Heal, S. Hallsworth, D. Famulari, R.M. Doherty, A.J. Dore, Y.S. Tang, C.F. Braban, D. Lever, M.A. Sutton, and S. Reis. The role of long-range transport and domestic emissions in determining atmospheric secondary inorganic particle concentrations across the UK. *Atmospheric Chemistry and Physics Discussions* 2013-820.
- 2013 Arjan Hensen, Ute Skiba and Daniela Famulari. Low cost and state of the art methods to measure nitrous oxide emissions. *Environ. Res. Lett.* Vol.8, Nb 2, doi:10.1088/1748-9326/8/2/025022.(url: http://iopscience.iop.org/1748-9326/8/2/025022/pdf/1748-9326_8_2_025022.pdf)
- 2011 S. K. Jones, D. Famulari, C. F. Di Marco, E. Nemitz, U. M. Skiba, R. M. Rees, and M. A. Sutton. Nitrous oxide emissions from managed grassland: a comparison of eddy covariance and static chamber measurements. *Atmos. Meas. Tech.*, 4, 2179-2194, 2011
- 2011 Twigg, M.M.; House, E.; Thomas, R.; Whitehead, J.; Phillips, G.J.; Famulari, D.; Fowler, D.; Gallagher, M.W.; Cape, J.N.; Sutton, M.A.; Nemitz, E.. Surface/atmosphere exchange and chemical interactions of reactive nitrogen compounds above a manured grassland. *Agricultural and Forest Meteorology*, 151 (12). 1488-1503. 10.1016/j.agrformet.2011.06.005.
- 2011 Polson, D.; Fowler, D.; Nemitz, E.; Skiba, U.; McDonald, A.; Famulari, D.; Di Marco, C.; Simmons, I.; Weston, K.; Purvis, R.; Coe, H.; Manning, A.J.; Webster, H.; Harrison, M.; O'Sullivan, D.; Reeves, C.; Oram, D.. Estimation of spatial apportionment of greenhouse gas emissions for the UK using boundary layer measurements and inverse modelling technique. *Atmospheric Environment*, 45. 1042-1049. 10.1016/j.atmosenv.2010.10.011
- 2010 Helfter, C., Famulari, D., Phillips, G.J., Barlow, J.F., Wood, C.R., Grimmond, C.S.B., Nemitz, E. Controls of carbon dioxide concentrations and fluxes above central London. *Atmospheric Chemistry and Physics Discussions* 10, 23739-23780.
- 2010 Famulari, D.; Fowler, D.; Nemitz, E.; Hargreaves, K.J.; Storeton-West, R.L.; Rutherford, G.; Tang, Y.S.; Sutton, M.A.; Weston, K.J.. Development of a low-cost system for measuring conditional time-averaged gradients of SO₂ and NH₃. *Environmental Monitoring and Assessment*, 161. 11-27.
- 2010 Famulari, Daniela; Nemitz, Eiko; Di Marco, Chiara; Phillips, Gavin J.; Thomas, Rick; House, Emily; Fowler, David. Eddy-covariance measurements of nitrous oxide fluxes above a city. *Agricultural and Forest Meteorology*, 150. 786-793.
- 2010 Langford, B.; Nemitz, E.; House, E.; Phillips, G.J.; Famulari, D.; Davison, B.; Hopkins, J.R.; Lewis, A.C.; Hewitt, C.N.. Fluxes and concentrations of volatile organic compounds above central London, UK. *Atmospheric Chemistry and Physics*, 10. 627-645.
- 2010 von Bobruzki, Kristina; Braban, Christine; Famulari, Daniela; Jones, Stephanie; Blackall, T.; Smith, T.E.L.; Blom, M.; Coe, H.; Gallagher, M.; Ghalaieny, M.; McGillen, M.R.; Pericval, C.J.; Whitehead, J.D.; Ellis, R.; Murphy, J.; Mohacsi, A.; Pogany, A.; Junninen, H.; Rantanen, S.; Sutton, Mark; Nemitz, Eiko. Field inter-comparison of eleven atmospheric ammonia measurement techniques. *Atmospheric Measurement Techniques*, 3. 91-112.
- 2010 Wood, C.R.; Lacser, A.; Barlow, J.F.; Padhra, A.; Belcher, S.E.; Nemitz, E.; Helfter, C.; Famulari, D.; Grimmond, C.S.B.. Turbulent flow at 190 m height above London during 2006-2008: A climatology and the applicability of similarity theory. *Boundary-Layer Meteorology*, 137. 77-96.
- 2010 Famulari, D.; Braban, C.; White, A.; Helfter, C.; Coyle, M.; Sutton, M.A.; Nemitz, E.. 2010 NH₃ release through a forest canopy: an agro-forestry experiment. In *Conference Proceedings of: Research, monitoring and modelling in the study of climate change and air pollution impacts on forest ecosystems*, Rome Italy, 5-7 October 2010. http://cost-fp0903.ipp.cnr.it/Downloads/Rome_Conference/BookAbstract.pdf
- 2009 Skiba, U., Drewer, J., Tang, Y.S., van Dijk, N., Helfter, C., Nemitz, E., Famulari, D., Cape, J.N., Jones, S.K., Twigg, M., Pihlatie, M., Vesala, T., Larsen, K.S., Carter, M.S., Ambus, P., Ibrom, A., Beier, C., Hensen, A., Frumau, A., Erismann, J.W., Bruggemann, N., Gasche, R., Butterbach-Bahl, K., Neftel, A., Spirig, C., Horvath, L., Freibauer, A., Cellier, P., Laville, P., Loubet, B., Magliulo, E., Bertolini, T., Seufert, G., Andersson, M., Manca, G., Laurila, T., Aurela, M., Lohila, A., Zechmeister-Boltenstern, S., Kitzler, B., Schaufler, G., Siemens, J., Kindler, R., Flechard, C., Sutton, M.A. Biosphere-atmosphere exchange of reactive nitrogen and greenhouse gases at the NitroEurope core flux measurement sites: Measurement strategy and first data sets. *Agriculture, Ecosystems and Environment* 133, 139-149.
- 2008 Whitehead, James D.; Twigg, Marsailidh; Famulari, Daniela; Nemitz, Eiko; Sutton, Mark A.; Gallagher, Martin W.; Fowler, David. Evaluation of laser absorption spectroscopic techniques for eddy covariance flux measurements of ammonia. *Environmental Science and Technology* 10.1021/es071596u, 42 (6). 2041-2046.
- 2007 Nemitz, Eiko; Langford, Ben; House, Emily; Phillips, Gavin; Famulari, Daniela; Cape, J. Neil; Davison, B.; Hewitt, N.. 2007 Micrometeorological measurements of anthropogenic VOC emissions from urban areas. In: Burrows et al, J., (ed.) *Volatile organic compounds in the polluted atmosphere: The 3rd ACCENT Barnsdale Expert Meeting*. Urbino, ACCENT Secretariat, 68-71.
- 2007 Sutton, M.A.; Nemitz, E.; Erismann, J.W.; Beier, C.; Butterbach Bahl, K.; Cellier, P.; de Vries, W.; Cotrufo, F.; Skiba, U.; Di Marco, C.; Jones, S.; Laville, P.; Soussana, J. F.; Loubet, B.; Twigg, M.; Famulari, D.; Whitehead, J.; Gallagher, M. W.; Neftel, A.; Flechard, C. R.; Herrmann, B.; Calanca, P. L.; Schjoerring, J. K.; Daemmgen, U.; Horvath, L.; Tang, Y. S.; Emmett, B. A.; Tietema, A.; Penuelas, J.; Kesik, M.; Brueggemann, N.; Pilegaard, K.; Vesala, T.; Campbell, C. L.; Olesen, J. E.; Dragosits, U.; Theobald, M. R.; Levy, P.; Mobbs, D. C.; Milne, R.; Viovy, N.; Vuichard, N.; Smith, J. U.; Smith, P.; Bergamaschi, P.; Fowler, D.; Reis, S.. 2007 Challenges in quantifying biosphere - atmosphere exchange of nitrogen species. *Environmental Pollution*, 150. 125-139. 10.1016/j.envpol.2007.04.014
- 2007 Nemitz, E.; Thomas, R.; Phillips, G.; Famulari, D.; Fowler, D.. 2007 Chemically resolved aerosol emission fluxes above six urban areas. In: *American Association for Aerosol Research Annual Meeting 2007*, Reno, 24-28 Sept

2007. American Association for Aerosol Research.
- 2006 C.E. Pitcairn, D. Fowler, I. Leith, L. Sheppard, S.Y. Tang, M.A. Sutton, D. Famulari :: "Diagnostic indicators of elevated nitrogen deposition" *Environmental Pollution*, 144 pp.941-950.
- 2005 FAMULARI D. "The surface-atmosphere exchange of ammonia and sulphur dioxide" - PhD Thesis, University of Edinburgh.
- 2004 Simon Smart, Ashmore M.R., Ashmore M.R., HORNUNG M., SCOTT W.A., FOWLER D., DRAGOSITS U., HOWARD D.C., SUTTON M.A., FAMULARI D. "Detecting the signal of atmospheric N deposition in recent national-scale vegetation change across Britain", *Water, Air and Soil Pollution: Focus*, 4(6), 269-278.
- 2004 D. Famulari, D.Fowler, K.J.Hargreaves, C. Milford, E.G.Nemitz, M.A. Sutton, K.Weston. "Measuring eddy covariance fluxes of ammonia using tunable diode laser absorption spectroscopy". *Water Air Soil Pollution -Focus* 4:151-158.