List of research activities

2021

CEREA

Atmospheric Environment Center

École des Ponts ParisTech & EDF R&D

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Director: Pietro BERNARDARA

Deputy director: Marc Bocquet

Deputy director: Martin Ferrand

LABORATORY STAFF
Staff: 55

Permanent research staff and faculty

BERNARDARA Pietro, EDF R&D, Director, HDR
BOCQUET Marc, École des Ponts ParisTech, Senior Researcher (ICPEF) and Professor, HDR
FERRAND Martin, EDF R&D, Research engineer and lecturer
CARISSIMO Bertrand, EDF R&D, Senior Researcher and Associate Professor, HDR
FARCHI Alban, École des Ponts ParisTech (IPEF), Researcher
KIM Youngseob, École des Ponts ParisTech, Research engineer
ROUSTAN Yelva, École des Ponts ParisTech, Researcher (CR1)
SARTELET Karine, École des Ponts ParisTech, Researcher (DR2), HDR

Administrative staff

PERIAC Lydie, École des Ponts ParisTech

Engineers

BENHAMADOUCHE Sofiane, EDF R&D, Engineer
BONNEL Jerome, EDF R&D, Engineer
CHARWATH Marcus, EDF R&D, Engineer
CUILHE Benoît, École des Ponts ParisTech Engineer
DEFOSSEZ Arièle EDF R&D, Research engineer
DEMENGEL Dominique, EDF R&D, Engineer
DUPONT Éric, EDF R&D, Research engineer
DUTREY Clémentine, École des Ponts ParisTech
GUINÉ Raphaël, École des Ponts ParisTech, Engineer
LEFRANC Yannick, EDF R&D, Engineer
LE GUENNIC Clémentine, EDF R&D, Engineer
MINIER Jean Pierre, EDF R&D, Engineer
PEYRE Camille, EDF R&D, Engineer
QUEMENER Aurélie, École des Ponts ParisTech Engineer
CHARLATCHKA Rayna, EDF R&D, Engineer
ROZBORSKI Sébastien EDF R&D, Engineer
WALL RIBOT Bénédicte, EDF R&D, Engineer
WALD Jean-Francois, EDF R&D, Engineer
WENDUM Denis, EDF R&D, Engineer

Technicians

FAUCHEUX Aurélien, École des Ponts ParisTech

Post-doctoral scientists

DIALLO Mouhamet, École des Ponts ParisTech (fin contrat au 1er octobre 2021)
FINN Tobias, École des Ponts ParisTech
KUZNETSOV Konstantin, École des Ponts ParisTech
LANNUQUE Victor, École des Ponts ParisTech
MILANI Riccardo, École des Ponts ParisTech
VANDERBECKEN Pierre, École des Ponts ParisTech

Ph.D. students

AL ASMAR Léa, EDF R&D & École des Ponts ParisTech, ED SIE
BALVET Guilhem, École des Ponts ParisTech, ED SIE
BOUNOUAS Hanane, IRSN & École des Ponts ParisTech, ED SIE
DUMONT-LE-BRAZIDEC Joffrey, IRSN & École des Ponts ParisTech, ED SIE
DURAND Charlotte, École des Ponts ParisTech
GALANTE-AMINO Hector, EDF R&D, ED SIE
JACQUOT Oscar, École des Ponts ParisTech ED SIE
JOSS Jerry, École des Ponts ParisTech
LANNES Marjolaine École des Ponts ParisTech
LAUNAY Emilie, LCPP, École des Ponts ParisTech
LI Xing, École des Ponts ParisTech
LUGON Lya, Ville de Paris & École des Ponts ParisTech, ED SIE
MAISON Alice, École des Ponts ParisTech ED SIE
MALARTIC Quentin, École des Ponts ParisTech
SARICA Thibaud, École des Ponts ParisTech ED SIE
SQUARCIONI Alexis, École des Ponts ParisTech, ED SIE
WANG Yunyi, École des Ponts ParisTech EDF R&D, ED SIE
WANG Zhizhao, École des Ponts ParisTech ED SIE

Interns

CUILHE Benoit, École des Ponts ParisTech
DACHRAOUI Assia,École des Ponts ParisTech

2021

Articles in peer-reviewed international journals

1. **M. Bocquet, A. Farchi** and **Q. Malartic**. *Online learning of both state and dynamics using ensemble Kalman filters.* Foundations of Data Science, 3, 305-330, 2021, 10.3934/fods.2020015

2. **C. L. Defforge, B. Carissimo, M. Bocquet, R. Bresson**, and P. Armand. *Improving numerical dispersion modelling in built environments with data assimilation using the iterative ensemble Kalman smoother.* Boundary-Layer Meteorol, 179, 209–240, 2021. 10.1007/s10546-020-00588-9

3. G. Evensen, J. Amezcua, **M. Bocquet**, A. Carrassi, **A. Farchi**, A. Fowler, P. L. Houtekamer, C. K. Jones, R. J. de Moraes, M. Pulido, C. Sampson and F. C. Vossepoel. *An international initiative of predicting the SARS-CoV-2 pandemic using ensemble data assimilation.* Foundations of Data Science, 3, 413-477, 2021, 10.3934/fods.2021001

4. J. Brajard, A. Carrassi, **M. Bocquet**, and L. Bertino, *Combining data assimilation and machine learning to infer unresolved scale parametrisation*, Phil. Trans. R. Soc. A, 379, 20200086, 2021, 10.1098/rsta.2020.0086

5. A. Hutt, **M. Bocquet**, A. Carrassi, L. Lei, and R. Potthast. *Editorial: Data Assimilation of Nonlocal Observations in Complex Systems.* Frontiers in Applied Mathematics and Statistics, 7, 9, 2021, 10.3389/fams.2021.658272.

6. **A. Farchi, M. Bocquet**, P. Laloyaux, M. Bonavita, and **Q. Malartic.** A *comparison of combined data assimilation and machine learning methods for offline and online model error correction.* Journal of Computational Science, 55, 101468, 2021, 10.1016/j.jocs.2021.101468

7. **A. Farchi**, P. Laloyaux, M. Bonavita, and **M. Bocquet.** *Using machine learning to correct model error in data assimilation and forecast applications*. Q. J. R. Meteorol. Soc., 147, 3067-3084, 2021, 10.1002/qj.4116

8. **J. Dumont Le Brazidec, M. Bocquet**, O. Saunier and **Y. Roustan.** *Quantification of uncertainties in the assessment of an atmospheric release source applied to the autumn 2017 106Ru event*. Atmos. Chem. Phys., 21, 13247–13267, 2021, 10.5194/acp-21-13247-2021

9. **L. Asmar**, L. Musson-Genon, **E. Dupont**, JC. Dupont and **K. Sartelet,** *Improvement of solar irradiance modelling during cloudy-sky days using measurements.* Solar energy, 230, 1175-1188, 2021, 10.1016/j.solener.2021.10.084.

10. B. Vansevenant, C. Louis, C. Ferronato., l; Fine, P. Tassel, P. Perret, E. Kostenidou, B. Temime-Roussel, B. D'Anna, **K. Sartelet**, V. Cerezo, and Y. Liu, *Evolution under dark conditions of particles from old and modern diesel vehicles, in a new environmental chamber characterized with fresh exhaust emissions*. Atmos. Meas. Tech., 14, 7627-7655, 2021, 10.5194/amt-2021-43

11. **L. Lugon**, J. Vigneron, C. Debert,, O. Chrétien, and **K. Sartelet,** *Black carbon modeling in urban areas: investigating the influence of resuspension and non-exhaust emissions in streets using the Street-in-Grid model for inert particles (SinG-inert).* Geosci. Model Dev., 14, 2021, 7001–7019, 10.5194/gmd-14-7001-2021

12. **V. Lannuque**, B. D'Anna, F. Couvidat, R. Valorso and **K. Sartelet,** *Improvement in modeling of OH and HO2 radical concentrations during toluene and xylene oxidation with RACM2 using MCM/GECKO-A.* Atmosphere, 12, 732, 2021, 10.3390/atmos12060732

13. **L. Lugon, K. Sartelet, Y. Kim,** J. Vigneron and O. Chrétien, *Simulation of primary and secondary particles in the streets of Paris using MUNICH.* Faraday Discuss., 226, 432-456, 2021, 10.1039/D0FD00092B

14. MS. Alam, W. Bloss, J. Brean, P. Brimblecombe, C. Chan, Y. Chen, H. Coe, P. Fu, S. Gani, J. Hamilton, R. Harrison, J. Jiang, M. Kulmala, **L. Lugon**, G. McFiggans, A. Mehra, A. Milsom, B. Nelson, C. Pfrang, **K. Sartelet**, Z. Shi, D. Srivastava, G. Stewart, P. Styring, H. Su, D. Van Pinxteren, E. Velasco and JZ. Yu, *General discussion: Aerosol formation and growth; VOC sources and secondary organic aerosols.* Faraday Discuss., 226, 479-501, 2021, 10.1039/D1FD90011K

15. EA. Fiorentino, Wortham H., and **K. Sartelet,** *Combining homogeneous and heterogeneous chemistry to model inorganic compound concentrations in indoor environments: the H2I model (v1.0)* Geosci. Model Dev., 14, 2747-2780, 2021, 10.5194/gmd-14-2747-2021

16. A. Quérel, D. Quélo, **Y. Roustan** and A. Mathieu, *Sensitivity study to select the wet deposition scheme in an operational atmospheric transport model.* J. Environ. Radioact., 237, 106712, 2021, 10.1016/j.jenvrad.2021.106712

17. ME. Gavidia-Calderón, S. Ibarra-Espinosa, **Y. Kim,** Y. Zhang, and MDF. Andrade, (2021) *Simulation of O3 and NOX in Sao Paulo street urban canyons with VEIN (v0.2.2) and MUNICH (v1.0).* Geosci. Model Dev., 14, 3251–3268, 2021, 10.5194/gmd-14-3251-2021, 2021

18. G. Guillossou and **Y. Roustan,** *Airborne particulate matter: An estimate of the health burden twice as high as the previous ones for $PM_{2.5}$ from fossil fuel combustion | Particules en suspension dans l'air: Une estimation du fardeau sanitaire deux fois plus importante que les précédentes pour les PM2,5 issues de la combustion des énergies fossiles.* Environnement, Risques et Sante, 20, 323–325, 2021.

19. S. Haouès-Jouve, A. Lemonsu, B. Gauvrau, A. Can, **B. Carrissimo**, N. Gaudio,, J. Hidalgo, C. Lopez-Rieu, D. Chouillou, I. Richard, L. Adolphe,, L. Berry-Chikhaoui, J. Bouyer, S. Challéat., C. De Munck, E. Dorier, G. Guillaume, S. Hooneart, J. Le Bras, D. Legain, JP. Levy, V. Masson, S. Marry, D. Nguyen-Luong, JC. Rojas-Arias and G. Zhenlan. *Cross-analysis for the assessment of urban environmental quality: An interdisciplinary and participative approach.* Environment and Planning B: Urban Analytics and City Science, 2021, 10.1177/23998083211037350

20. **B. Carissimo**, S. Trini and G. Castelli, Tinarelli, JRII special sonic anemometer study: A first comparison of building wakes measurements with different levels of numerical modelling approaches. Atmos. Environ., 244, 117798, 2021, 10.1016/j.atmosenv.2020.117798

21. **M. Ferrand**, J.C. Harris, *Finite volume arbitrary Lagrangian-Eulerian schemes using dual meshes for ocean wave applications,* Computers & Fluids, 219, 2021, 10.1016/j.compfluid.2021.104860

International conference oral presentations

1. **M. Bocquet**, J. Brajard, A. Carrassi, L. Bertino, **A. Farchi**, **Q. Malartic**, M. Bonavita and P. Laloyaux: *Using machine learning and data assimilation to learn both dynamics and state*, virtual visit then online seminar at the Atmosphere and Ocean department of McGill University, January 4, 2021, Montreal, Canada. [Invited]

2. **M. Bocquet, Q. Malartic** and **A. Farchi**: S*tate, global and local parameter estimation using local ensemble Kalman filters: applications to online machine learning of chaotic dynamics*. Seminar, LMU Colloquia in Data Science for Atmospheric and Ocean Applications, January 4, 2021, Munich, Germany. [Invited]

3. **A. Farchi, M. Bocquet**, P. Laloyaux and M. Bonavita. Model error correction with data assimilation and machine learning machine learning for numerical weather predictions and climate services - A workshop for Member and Co-operating States, April 15, 2021, ECMWF. [invited]

4. **M. Bocquet, Q. Malartic** and **A. Farchi**: *Using Machine Learning and Data Assimilation to Learn Chaotic Dynamics and State Trajectories*. SIAM Dynamical Systems 21, Mini-Symposium MS47 - Data-Driven Methods for Prediction and Model Discovery, May 24, 2021, Portland, USA. [Invited]

5. C. Grudzien, **M. Bocquet** and A. Carrassi. *On the numerical integration of the Lorenz-96 model, with scalar additive noise, for benchmark twin experiments*. SIAM Dynamical Systems 21, Mini-Symposium MS99 - Reduced-Order Models for Data Assimilation, May 25, 2021, Portland, USA. [Invited]

6. A. Carrassi, L. Bertino, **M. Bocquet,** J. Brajard, J. Demaeyer, C. Grudzien, P. Raanes and S. Vannitsem. *Data assimilation: From model-driven to data-driven.* SIAM Dynamical Systems 21, Mini-Symposium MS99 - Reduced-Order Models for Data Assimilation, May 25, 2021, Portland, USA. [Invited]

7. **J. Dumont Le Brazidec**, **M. Bocquet**, O. Saunier and **Y. Roustan.** B*ayesian inference and uncertainty quantification for source reconstruction of 137Cs released during the Fukushima accident*, European Geosciences Union Assembly, April 26, 2021.

8. **Q. Malartic, M. Bocquet** and **A. Farchi.** *State, global and local parameter estimation using local ensemble Kalman filters: applications to online machine learning of chaotic dynamic,* European Geosciences Union Assembly, April 27, 2021.

9. **A. Farchi**, P. Laloyaux, M. Bonavita and **M. Bocquet.** *Using machine learning to correct model error in data assimilation and forecast applications* European Geosciences Union Assembly, April 30, 2021.

10. A. Carrassi, L. Bertino, **M. Bocquet**, J. Brajard, J. Demaeyer and S. Vannitsem. *Data assimilation in coupled chaotic dynamics and its combination to machine learning to infer unresolved scale error.* Fifth online event of ISDA-online, theme 'Coupled Data Assimilation', May 7, 2021.

11. **A. Farchi**, P. Laloyaux, M. Bonavita and **M. Bocquet.** *Using machine learning to correct model error in data assimilation and forecast applications.* International Conference on Computational Science, June 16-18, 2021, Krakow, Poland & online.

12. **M. Bocquet** and many others. *Data Assimilation and Machine Learning Unification (for dynamical systems and model error).* Utrecht Summer School Data science and beyond – Data assimilation with elements of machine learning, August 23-27, 2021.

13. J. Brajard, L. Bertino, **M. Bocquet,** A. Carrassi and **A. Farchi.** *Combining machine learning with data assimilation to improve numerical models and estimate the system's state.* The 3rd NOAA Workshop on Leveraging AI in Environmental Sciences. September 12-17, 2021.

14. O. Pannekoucke, R. Ménard, **M. Bocquet,** R. Fablet, A. Perrot, S. Ricci and O. Thual. *Contributions of the parametric Kalman filter in practical and theoretical data assimilation* WCRP-WWRP Symposium on Data Assimilation and Reanalysis, alongside the 2021 ECMWF Annual Seminar on Observations, September, 13-18, 2021.

15. **Q. Malartic, M. Bocquet** and **A. Farchi.** *State, global and local parameter estimation using ensemble Kalman filters for model error correction.* WCRP-WWRP Symposium on Data Assimilation and Reanalysis, alongside the 2021 ECMWF Annual Seminar on Observations, September 13-18, 2021.

16. **A. Farchi, M. Bocquet,** M. Bonavita and P. Laloyaux. *Model error correction with data assimilation and machine learning.* WCRP-WWRP Symposium on Data Assimilation and Reanalysis, alongside the 2021 ECMWF Annual Seminar on Observations, September 13-18, 2021.

17. **M. Bocquet, A. Farchi, Q. Malartic**, J. Brajard, A. Carrassi, L. Bertino, M. Bonavita and P. Laloyaux. *Combining data assimilation and machine learning.* The 43rd European Working Group on Limited-Area Modelling (EWGLAM) and 28th Short Range NWP (SRNWP) EUMETNET meetings. September 27-October 1, 2021. [Invited]

18. **A. Farchi, M. Bocquet,** M. Bonavita and P. Laloyaux. *Model error correction with data assimilation and machine learning.* ESA-ECMWF Workshop - Machine Learning for Earth System Observation and Prediction. November 15-18, 2021. [Invited]

19. **T. Finn.** *The self-attentive ensemble transformer: Representing ensemble interactions in neural networks* ESA-ECMWF Workshop - Machine Learning for Earth System Observation and Prediction, November 15-18, 2021.

20. **T. Finn.** *Making the explicit link between Gaussian process regression and ensemble data assimilation.* SASIP Webinar, November 24, 2021.

21. **Q. Malartic, A. Farchi** and **M. Bocquet.** *State, global and local parameter estimation using ensemble Kalman filters: applications to online machine learning of chaotic dynamics. ISDA Online 2022 workshop;* Machine Learning for Data Assimilation, December 3, 2021.

22. J. Brajard, L. Bertino, **M. Bocquet,** A. Carrassi, A. and **A. Farchi.** *Combining machine learning with data assimilation to improve numerical models and estimate the system's state.* AGU Fall Meeting, New Orleans, Louisiana, USA & online. December 13-17, 2021.

23. **K. Sartelet, Y. Kim, L. Lugon, Y. Roustan, T. Sarica,** B. Marques and D'Anna B. *Influence of traffic on particle concentrations in cities. Mitigation and forestalling of Secondary Aerosol formation.* The role of vehicle emissions, European Comission, Joint Research Center, Italy, 22-24 September 2021. [Invited]

24. **T. Sarica, K. Sartelet, Y. Roustan, Y. Kim, L. Lugon,** M. André, B. Marques, B. D'Anna, C. Chaillou, C. Norsic, C. Larrieu and E. Laigle, *Modelling pollutant concentrations in streets: a sensitivity analysis to asphalt and traffic related emissions*. International Technical Meeting On Air Pollution Modelling And Its Application, Barcelon, Spain, 18-22 October 2021.

25. C. Lin, R. Ooka, **K. Sartelet, Y. Wang,** C. Flageul, **Y. Kim,** H. Kikumoto and **B. Carissimo,** *Prediction of aerosol dispersion within a street canyon by coupled simulation of chemical reaction, particle dynamics, and CFD*. The Japan Society Fluid Mechanics Annual Meeting 2021, 21-23 September, 2021, Online

26. **Z. Wang,** F. Couvidat, and **K. Sartelet,** *GENOA: the generator of semi-explicit mechanisms for SOA modeling*, The International Aerosol Modeling Algorithms Conference, UC Davis, Hosted Virtually, 7-10 December, 2021.

27. **L. Asmar**, L. Musson-Genon, **E. Dupont** and **K. Sartelet,** *Study on the role of Black Carbon aerosols in cloud droplets during the dissipation of a fog.*, European Meteorological Society, 3-10 September 2021, Online.

28. B. Marques, E. Kostenidou, B. Temime-Roussel, L. Fine, C. Ferronato, B. Vansevenant, Y. Liu, M. Andre, **K. Sartelet**, and B. D'Anna, *Primary and secondary emissions from Euro6 diesel and gasoline vehicles during the POLEMICS campaign: chemical characterization of gas and particle phases*. European Aerosol Conference, 30 August – 3 September 2021, online.

29. **Y. Wang,** C. Flageul, **A. Maison, B. Carissimo and K. Sartelet,** *Impact of tree-related processes on the air quality in a street canyon using CFD coupled with chemical module SSH-Aerosol.* Georges Mason University Conference on Transport & Dispersion Modeling, 2 November 2021, online.

30. **A. Maison,** C. Flageul, **Y. Wang, B. Carissimo** and **K. Sartelet,** *Parametrization of exchanges in street canyons with trees based on CFD simulations.* Georges Mason University Conference on Transport & Dispersion Modeling, 2 November 2021, online.

31. V. Riffault, B. D'Anna, **Y. Roustan**, E. Escat, J. Cortinovis, A. Armengaud, H. Lim and Y. Lee, *PIRATE (Port Inventories ReAl TimE) : Overview of an upcoming French-Korean project.* Europe-Korea Conference on Science and Technology, 31 October 2021.

32. **B. Guilhem, M. Ferrand, Y. Roustan**, C. Henry and **JP. Minier**. *Wall function boundary conditions for consistent hybrid Moments / PDF approaches*, EUROMECH Colloquium 621, Transport and fluxes in dispersed turbulent flows, 30 June - 2 July 2021.

33. **M. Ferrand,** M. Guingo, **C. Beauchêne**, M. Mimoun, **J.-P. Minier**. *Modelling buccopharyngeal droplet dispersion in an intensive care unit for Covid patients*, EGU General Assembly Conference Abstracts, EGU21-7187, 2021/4.

International conference poster presentations

1. **Z. Wang,** F. Couvidat and **K. Sartelet**, *Automatic generation from MCM of reduced mechanisms to study the formation and evolution of SOA in 3D air quality models,* EGU General Assembly, Online, 19-30 April 2021.

2. **L. Asmar,** L. Musson-Genon, **E. Dupont** and **K. Sartelet,** *Improvement of radiation modelling during cloudy-sky days using in-situ measurements,* EGU General Assembly, Online, 19-30 April 2021.

National conference oral

1. **G. Balvet, M. Ferrand, Y. Roustan**, C. Henry and **JP. Minier.** *Wall function boundary conditions for consistent hybrid Moments / PDF approaches.* GDR Turbulence, October 2021, online.

Committee activities

Editorial boards

- **M. Bocquet,** Associate Editor, "Quartely Journal of the Royal Meteorological Society".

- **M. Bocquet,** Guest Editor of the special collection *Combined machine learning and data assimilation for the atmosphere and ocean sciences in the* "Quartely Journal of the Royal Meteorological Society".

- **M. Bocquet,** Associate Editor, "Foundations of Data Science", journal of the AIMS.

- **M. Bocquet,** Guest Editor, for the topic *Data Assimilation of Nonlocal Observations in Complex systems* of "Frontiers in Applied Mathematics and Statistics".

- **M. Bocquet,** Associate Editor for the topic *Dynamical Systems in "*Frontiers in Applied Mathematics and Statistics".

- **K.Sartelet,** Guest Editor for the journal Atmos. Chem. Phys. on the topic "Air quality research at street level".

- **K.Sartelet**, Editor for the journal "Atmosphere".

Conference organization

- N. Schenk, **M. Bocquet**, M. Pulido, and L. Nerger. *Co-organiser and co-Chair of the ISDA Online 2022 workshop;* Machine Learning for Data Assimilation, December 3, 2021.

- **M. Bocquet.** Member of the scientific committee. ESA-ECMWF Workshop - Machine Learning for Earth System Observation and Prediction, November 15-18, 2021.

Conference session chairs

- **M. Bocquet.** *Chair of the session* Session 3.2: Geophysical Forecasting with ML and Hybrid Models ESA-ECMWF Workshop - Machine Learning for Earth System Observation and Prediction, November 15-18, 2021.

- **M. Bocquet.** Panelist of the Side Meeting on ML for NWP at the 43rd EWGLAM and 28th SRNWP Meeting, organised by the ACCORD consortium, September 28, 2021.

- **Y. Roustan**. Co-chair of the session 2a Air Pollution of the THNS 2021 forum "Resilient City and Transport", October 28-29, 2021.

Scientific committees

- **M. Bocquet**, member of the Scientific Council, European Center for Scientific Computing (CERFACS).

- **M. Bocquet, P. Bernardara,** Management Committee members, Institut Pierre-Simon Laplace Institute (IPSL)**.**

- **M. Bocquet**, member of the Prix André Prud'Homme Committee of the Meteorology and Climate Society.

- **M. Bocquet**, Bureau member of SAMA (Statistique pour l'Analyse, la Modélisation et l'Assimilation) of Institut Pierre-Simon Laplace Institute (IPSL).

- **M. Bocquet,** member of the Scientific Council of the GDR "Défis théoriques pour les sciences du climat"

- **K. Sartelet**, Member of the scientific board of the emerging DIM (Major Area of Interest) QI^2 (Air Quality, Health Impacts and Technological and Policy Innovations Network).

- **K. Sartelet**, Member of the OSU-EFLUVE board as representative of the college A called "university professors and assimilated personnel ».

- **K. Sartelet**, Co-animation of the "Atmospheric composition and air quality" theme of IPSL.

- **Y. Roustan**, Member of the OSU-EFLUVE board as representative of the college B called "other teaching / research personnel and assimilated ».

- **Y. Roustan**, Member of the OSU-EFLUVE scientific committee as representative of the college B called "other teaching / research personnel and assimilated ».

Thesis committees

- **M. Bocquet**, PhD advisor, PhD, Joffrey Dumont Le Brazidec, "Inférence bayésienne et quantification d'incertitudes pour l'estimation de sources de rejets de radionucléides", École des Ponts ParisTech, March 29, 2021.

- **M. Bocquet**, Examiner, PhD, Nishant KUMAR, "Data-Driven Flow Modelling Using Machine Learning and Data Assimilation", September 8, 2021, Université de Poitiers, France.

- **K. Sartelet,** Examiner, PhD, Lei Jiang, "Improvement of high resolution air quality simulation and forecast", June 21, 2021, INERIS, France.

- **K. Sartelet,** PhD advisor, PhD, Lya Lugon, "Air quality modelling in the streets of Paris", École des Ponts ParisTech, July 1, 2021.

- **K. Sartelet**, PhD advisor, PhD, Léa Al. Asmar, Modelling solar radiation for PV optimization, École des Ponts ParisTech, December 16, 2021.

- **Y. Roustan**, PhD co-advisor, PhD, Joffrey Dumont Le Brazidec, "Inférence bayésienne et quantification d'incertitudes pour l'estimation de sources de rejets de radionucléides", École des Ponts ParisTech, March 29, 2021.

- **Y. Roustan**, Examiner and Rapporteur, PhD, Oumar Telly Bah, "Détermination expérimentale et modélisation du dépôt par temps sec de l'iode élémentaire gazeux", Aix Marseille Université, January 14, 2021.

- **Y. Roustan**, Examiner and Rapporteur, PhD, Sakina Takache, "Vers le transport multi-echelles de panaches tranchants", École Polytechnique, December 6, 2021.

- **Y. Roustan**, Examiner, PhD, Rebecca Kutzner, "Evolution of ammonia and ammonium particles analysed by remote sensing from the ground and space", Université Paris-Est, December 15, 2021.

HdR committees

- **K. Sartelet,** Examiner, HdR, Amine MEHEL, Contribution à l'amélioration de la qualité de l'air par la caractérisation et le contrôle des écoulements. ESTACA, University Paris Saclay, July 12, 2021.

Teaching

École des Ponts ParisTech and affiliated masters

- **M. Bocquet** and **A. Farchi**, "Introduction to Data Assimilation", Master MOCIS et WAPE Num2.2 and ADOMO (École des Ponts ParisTech)

- **K. Sartelet.** Responsible and teaching in the 2nd year course POLU1 "Atmospheric environment and air quality".

- **K. Sartelet and Y. Kim,** supervision of four first year students for a project on air quality.

- **Y. Roustan**, co-organize and teaching "Externalités des Transport", Master TraDD.

- **Y. Roustan**, teaching course "Pollution de l'air", Master MISE.

- **Y. Roustan** (organize and teaching) **and K. Sartelet** (teaching), "Modélisation de la pollution atmosphérique" Master SGE (M2 Air, Paris Diderot - UPEC – ENPC).
- **M. Ferrand**, (teaching) Mécanique des fluides incompressibles - 1 (2ème année Ecole des Ponts, 6x3-hour lectures).

- **M. Ferrand**, (teaching) Mécanique des fluides incompressibles - 2 (2ème année Ecole des Ponts, 6x3-hour lectures).

- **M. Ferrand**, (responsible and teaching) Simulation numérique de l'aéraulique et de la qualité de l'air en milieu urbain (2ème année Ecole des Ponts, 6x2.5 hours).

Ecole Normale Supérieure Paris Saclay

M. Ferrand, (teaching) Cours de Mécanique des Fluides - 2 (M2FESup Génie civil, 6x2-hour lectures).

École Nationale des Travaux Publics de l'État

- **Y. Roustan** (organisation and teaching)**,** "Qualité de l'air et santé", engineer cursus of ENTPE.