

Georgios Grivas

Chemical Engineer PhD

Research Scientist, Institute for Environmental Research and Sustainable Development (IERSD/NOA)

A1. Personal Information

Date / Place of Birth: 31.07.1977 / Athens
Nationality: Greek
Work Address: Lofos Koufou, Penteli, 15246 (IERSD/NOA)
Tel.: +30-2108109219
E-mail: ggrivas@noa.gr
Webpage: <http://apcg.meteo.noa.gr/index.php/people/19-georgios-grivas>
Scopus id <https://www.scopus.com/authid/detail.uri?authorId=8434294400>
ORCID: <https://orcid.org/0000-0001-5023-7039>
Researcher id: <https://publons.com/researcher/AAX-3000-2021/> (AAX-3000-2021)

A2. Education

University Degrees

2013 **Engineering Doctorate (PhD)**
Department of Chemical Sciences, School of Chemical Engineering, National Technical University of Athens (NTUA)
Doctoral Dissertation: "Particulate matter concentrations in the atmosphere of Athens: spatial and temporal variability – predictive models"

2000 **Chemical Engineering Diploma** (grade 7.94/10)
School of Chemical Engineering, National Technical University of Athens
Diploma Thesis: "Particulate matter and air quality assessment in Athens"

Foreign Languages

English: Excellent (C2 – CPE, 1993) / Italian: Good (B2 – CELI 3, 2018)

A3. Work experience

2022 – now **Research Scientist (grade C)**
Institute for Environmental Research and Sustainable Development, National Observatory of Athens

2017-2022 **Post-Doctoral Researcher**
Institute for Environmental Research and Sustainable Development, National Observatory of Athens

2013-2015 **Post-Doctoral Researcher**
Laboratory of Hygiene, Epidemiology and Medical Statistics, School of Medicine, National and Kapodistrian University of Athens (NKUA)

2010-2011 **Research Associate**
Laboratory of Hygiene, Epidemiology and Medical Statistics, School of Medicine, National and Kapodistrian University of Athens

2009-2010 **Scientific Associate**
National Center for the Environment and Sustainable Development (NCESD)

2001-2012 **Research Associate – Teaching Assistant**
School of Chemical Engineering, National Technical University of Athens

A4. Professional Expertise

i) Scientific instrumentation

- Samplers and online analyzers for particulate matter
- Reference instrumentation for regulatory gaseous pollutants
- Particle number counters/sizers (CPC, OPC, SPMS)
- Online analyzers for aerosol chemical composition (metals, organic aerosols, elemental carbon)
- Monitors for aerosol optical properties (e.g. online and portable aethalometers)
- Sensor-based systems for gaseous/particulate pollutants and passive samplers for gases

ii) Scientific software

- Statistical analysis and modeling: SPSS, Statistica, IgorPro, Origin, Minitab, Matlab, RStudio etc.
- Spatial analysis/GIS: ESRI ArcGIS
- Specialized software for air quality and receptor modelling: EPA-PMF, EPA-UNMIX, Openair, Zefir, NOAA Hysplit etc.

B1. Research experience and interests

- *Online and offline in situ measurements for the long-term characterization of air pollution in high temporal resolution*
 - Measurement of PM and gaseous pollutants using reference-grade or portable devices
 - Monitoring of particle number concentrations and size distributions
 - Characterization of aerosol optical properties with focus on absorbing particles
 - Online chemical analysis of aerosols for organic matter, elemental carbon and trace metals
- *Utilization of innovative sensor technologies for real-time monitoring of air quality in dense networks*
 - Implementation, evaluation and calibration of optical and electrochemical sensors for measurements of gaseous (CO, NO_x, O₃) and particulate (PM, BC) pollutants
 - Design and development of monitoring networks and online visualization [platforms](#), aimed at providing information to citizens-authorities and supporting spatial and atmospheric models
 - Utilization of sensors in novel monitoring platforms (e.g. mobile, pedestrian, personal) to provide information on the individual exposure to harmful pollutants
- *Statistical analysis of atmospheric data for the characterization of air quality*
 - Descriptive and inferential statistics for measurement quality assurance and data analysis
 - Time-series analysis (autoregressive models, spectral analysis)
 - Spatial analysis (geostatistics, spatial interpolation, GIS analysis, regression mapping)
 - Advanced models for continuous and discrete data (linear, generalized linear, mixed effects)
 - Multivariate techniques (factor analysis, PCA, cluster analysis)
- *Chemometric methods for aerosol source apportionment*
 - Receptor modeling with focus on Positive Matrix Factorization (PMF) for diverse aerosol data (e.g. ionic/elemental composition of fine-coarse particles, organic aerosols, polycyclic aromatic compounds, physical aerosol properties) on variable spatiotemporal scales
 - Tracer-based statistical models for source apportionment
 - Analysis of meteorological data and air mass back-trajectories for the geolocation of pollutant sources (e.g. CPF, CPBF, PSCF, CWT)
- *Predictive models for air pollution levels and episodes*
 - Artificial neural network models (e.g. MLP, RBF)
 - Meta-heuristic techniques for global optimization (genetic algorithms, simulated annealing)
 - Regression models, partial least square models, classification and regression trees

B2. Employment in Research projects

- 1) "GAUSS: Generating Advanced Usage of Earth Observation for Smart Statistics". Funding: European Space Agency. Contractor: IERSD-NOA. 10/2021 – now (*member of the project team*).
- 2) "e-shape: EuroGEO Showcases, Pilot 2.3: EO-based pollution-health risks profiling in the urban environment". Funding: H-2020-SC5-2018-2. Contractor: IERSD-NOA. 01/2022 – 02/2022.
- 3) "PANACEA: Panhellenic infrastructure for atmospheric composition and climate change". Funding: National Strategic Reference Framework (NSRF) 2014-2020. Contractor: IERSD-NOA. 06/2020 – 12/2021.
- 4) "ERA PLANET: European network for observing our changing planet". Funding: ERA-NET-Cofund Grant/H-2020. Contractor: IERSD-NOA. 04/2021 – 12/2021.
- 5) "Long-term characterization, in high temporal resolution, of the chemical composition and sources of the atmospheric aerosol over the greater Athens area". Funding: NSRF - Human Resources Development, Education and Lifelong Learning 2014-2020". Contractor: University of Crete. 01/2020 – 03/2021 (*post-doctoral research grant*).
- 6) "EMISSION: Environmental monitoring integrated system using an IoT network". Funding: ERDF/GSRT, Research Create Innovate (EDK). Contractor: IERSD-NOA. 11/2019 – 01/2021.
- 7) "PiraeusAQ: Specialized measurements of atmospheric pollution in the greater area of Piraeus". Funding: Regional Authority of Attica. Contractor: IERSD-NOA. 11/2018 – 10/2019.
- 8) "Greece: State of the environment reporting (sections: Climate Change, Air Quality, Environmental Noise)". Funding: National Center of Environment and Sustainable Development. Contractor: IERSD-NOA. 02/2018 – 04/2018.
- 9) "Chemical composition of particulate matter in the atmosphere of Athens and identification/quantification of sources". Funding: National Scholarships Foundation (IKY-SIEMENS). 09/2016-08/2017 (*post-doctoral research grant*).
- 10) "RESPOZE-children: Respiratory effects of Ozone in children". Funding: National Strategic Reference Framework (NSRF) 2007-2013, ARISTEIA-I. Contractor: NKUA - School of Medicine. 07/2014 – 03/2015.
- 11) "ESCAPE: European Study of Cohorts for Air Pollution Effects". Funding: EU 7th Framework Programme, ENV.2007.1.2.2.2. Contractor: Universiteit Utrecht/ NKUA - School of Medicine. 01/2010 – 04/2011.
- 12) "Carrying-out of the national reporting obligations according to the Geneva Convention, the 166/2006/EC Regulation and the Directives 99/13/EC και 2001/81/EC". Funding: Ministry for the Environment, City Planning and Public Works. Contractor: NCESD. 07/2009 – 03/2010.
- 13) "Study of fine and ultrafine particle pollution in the area of Athens - Spatiotemporal variation and source apportionment". Funding: ESF-Greek Ministry of Education (EPEAEK-II: Pythagoras-II). Contractor: NTUA. 03/2005 – 12/2007.
- 14) "Upgrading the curriculum of the School of Chemical Engineering, NTUA, by incorporating information technologies". Funding: ESF - Greek Ministry of Education (EPEAEK-II). Contractor: NTUA. 09/2004 – 03/2005.
- 15) "Study of the chemical composition of respirable particles (PM₁₀) in the atmosphere of Athens". Funding: ERDF - Greek Ministry for the Environment, City Planning and Public Works (EPPER 2000-2006). Contractor: Aristotle University of Thessaloniki. 07/2001 – 06/2002.
- 16) "Creation of a laboratory network for total environmental quality control". Funding: Operational Program for Research and Technology (EPET-II), GSRT-Impetus. Contractor: NKUA. 04/2001 – 10/2001.

B3. Participation in Scientific Unions

- Member of the Atmospheric Chemistry and Physics Group (APCG), IERSD-NOA
- Member of the General Assembly of the Research Infrastructure PANGEA
- Member of the Technical Chamber of Greece
- Member of the European Geosciences Union

C1. Reviewed publications

i) Dissertations

- 1) **G. Grivas**: “Particulate matter and air quality assessment in Athens”, *Diploma Thesis*. School of Chemical Engineering, NTUA, 2000, pages 212.
- 2) **G. Grivas**: “Particulate matter concentrations in the atmosphere of Athens: spatial and temporal variability – predictive models”, *Doctoral Dissertation*. School of Chemical Engineering, NTUA, 2013, pages 506, [doi: 10.12681/eadd/43211](https://doi.org/10.12681/eadd/43211)

ii) Book Chapters

- 1) N. Mihalopoulos, V. Assimakopoulos, E. Gerasopoulos, C. Giannakopoulos, **G. Grivas**, A. Kotronarou: “Climate Change – Air Quality – Environmental Noise”, in: “*Greece: State of the Environment Report 2018*”. Athens: National Center of Environment and Sustainable Development, ISBN: 978-960-99033-7-0, pp. 24-225.
- 2) D. Kaskaoutis, E. Liakakou, **G. Grivas**, E. Gerasopoulos, N. Mihalopoulos, A. Alastuey, F. Dulac, M. Pandolfi, J. Sciare, G. Titos. “Chemical composition and levels of concentrations of aerosols in the Mediterranean”, in: “*Atmospheric Chemistry in the Mediterranean Region*”, edited by: F. Dulac, S. Sauvage, E. Hamonou. Cham CH: Springer, 2022.
- 3) D. Kaskaoutis, E. Liakakou, **G. Grivas**, E. Gerasopoulos, N. Mihalopoulos, A. Alastuey, F. Dulac, U.C. Dumka, M. Pandolfi, M. Pikridas, J. Sciare, G. Titos “Inter-annual variability and long-term trends of aerosols above the Mediterranean”, in: “*Atmospheric Chemistry in the Mediterranean Region*”, edited by: F. Dulac, S. Sauvage, E. Hamonou. Cham CH: Springer, 2022

iii) Journal articles (47)

- 1) A. Chaloulakou, **G. Grivas**, N. Spyrellis: “Neural network and multiple regression models for PM₁₀ prediction in Athens. A comparative assessment”, *Journal of the Air and Waste Management Association*, 53, 1183-1190, 2003, [doi: 10.1080/10473289.2003.10466276](https://doi.org/10.1080/10473289.2003.10466276)
- 2) **G. Grivas**, A. Chaloulakou, C. Samara, N. Spyrellis: “Spatial and temporal variation of PM₁₀ mass concentrations within the Greater Area of Athens, Greece”, *Water Air Soil Pollution*, 158, 357-371, 2004, [doi: 10.1023/B:WATE.0000044859.84066.09](https://doi.org/10.1023/B:WATE.0000044859.84066.09)
- 3) A. Chaloulakou, P. Kassomenos, **G. Grivas**, N. Spyrellis: “Particulate matter and black smoke concentration levels in Central Athens, Greece”, *Environment International*, 31, 651-659, 2005, [doi: 10.1016/j.envint.2004.11.001](https://doi.org/10.1016/j.envint.2004.11.001)
- 4) N. Manalis, **G. Grivas**, V. Protonotarios, A. Moutsatsou, C. Samara, A. Chaloulakou: “Toxic metal content of particulate matter (PM₁₀) within the Greater Area of Athens”, *Chemosphere*, 60, 557-566, 2005, [doi: 10.1016/j.chemosphere.2005.01.003](https://doi.org/10.1016/j.chemosphere.2005.01.003)
- 5) **G. Grivas**, A. Chaloulakou: “Artificial neural network models for prediction of PM₁₀ hourly concentrations, in the Greater Area of Athens, Greece”, *Atmospheric Environment*, 40, 1216-1229, 2006, [doi: 10.1016/j.atmosenv.2005.10.036](https://doi.org/10.1016/j.atmosenv.2005.10.036)
- 6) I. Gavriil, **G. Grivas**, P. Kassomenos, A. Chaloulakou, N. Spyrellis: “An application of theoretical probability distributions, to the study of PM₁₀ and PM_{2.5}-time series in Athens, Greece”, *Global Nest Journal*, 8, 241-251, 2006, [doi: 10.30955/gnj.000401](https://doi.org/10.30955/gnj.000401)
- 7) E. Diapouli, **G. Grivas**, A. Chaloulakou, N. Spyrellis: “PM₁₀ and ultrafine particles counts in-vehicle and on-road in the Athens Area”, *Water Air Soil Pollution Focus*, 8, 89-97, 2008, [doi: 10.1007/s11267-007-9136-8](https://doi.org/10.1007/s11267-007-9136-8)
- 8) **G. Grivas**, A. Chaloulakou, P. Kassomenos: “An overview of the particle pollution problem in the Metropolitan Area of Athens, Greece. Assessment of controlling factors and potential impact of long range transport”, *Science of the Total Environment*, 389, 165-177, 2008, [doi: 10.1016/j.scitotenv.2007.08.048](https://doi.org/10.1016/j.scitotenv.2007.08.048)
- 9) E. Koulouri, **G. Grivas**, E. Gerasopoulos, A. Chaloulakou, N. Mihalopoulos, N. Spyrellis: “A study of size-segregated particle (PM₁, PM_{2.5}, PM₁₀) concentrations over Greece”, *Global Nest Journal*, 10, 132-139, 2008, [doi: 10.30955/gnj.000554](https://doi.org/10.30955/gnj.000554)

- 10) C. Theodosi, **G. Grivas**, P. Zarnpas, A. Chaloulakou, N. Mihalopoulos: "Mass and chemical composition of size-segregated aerosols (PM₁, PM_{2.5}, PM₁₀) over Athens, Greece: Local versus regional sources", *Atmospheric Chemistry and Physics*, 11, 11895-11911, 2011, [doi: 10.5194/acp-11-11895-2011](https://doi.org/10.5194/acp-11-11895-2011)
- 11) **G. Grivas***, S. Cheristanidis, A. Chaloulakou: "Elemental and organic carbon in the urban environment of Athens. Seasonal and diurnal variations and estimates of secondary organic carbon", *Science of the Total Environment*, 414, 535-545, 2012, [doi: 10.1016/j.scitotenv.2011.10.058](https://doi.org/10.1016/j.scitotenv.2011.10.058)
- 12) P. Kassomenos, S. Vardoulakis, A. Chaloulakou, **G. Grivas**, R. Borge, J. Lumbreras: "Levels, sources and seasonality of coarse particles (PM₁₀-PM_{2.5}) in three European Capitals - Implications for particulate pollution control", *Atmospheric Environment*, 54, 337-347, 2012, [doi: 10.1016/j.atmosenv.2012.02.051](https://doi.org/10.1016/j.atmosenv.2012.02.051)
- 13) M. Eeftens, M.-Y. Tsai, C. Ampe, B. Anwander, R. Beelen, T. Bellander, G. Cesaroni, M. Cirach, J. Cyrys, K. de Hoogh, A. De Nazelle, F. de Vocht, C. Declercq, A. Dedele, K. Eriksen, C. Galassi, R. Grazuleviciene, **G. Grivas**, (...), G. Hoek: "Spatial variation of PM_{2.5}, PM₁₀, PM_{2.5} absorbance and PMcoarse concentrations between and within 20 European study areas and the relationship with NO₂ – Results of the ESCAPE project", *Atmospheric Environment*, 62, 303-317, 2012, [doi: 10.1016/j.atmosenv.2012.08.038](https://doi.org/10.1016/j.atmosenv.2012.08.038)
- 14) J. Cyrys, M. Eeftens, J. Heinrich, C. Ampe, A. Armengaud, R. Beelen, T. Bellander, T. Beregszaszi, M. Birk, G. Cesaroni, M. Cirach, K. de Hoogh, A. De Nazelle, F. de Vocht, C. Declercq, A. Dedele, K. Dimakopoulou, K. Eriksen, C. Galassi, R. Grauleviciene, **G. Grivas**, (...), G. Hoek: "Variation of NO₂ and NO_x concentrations between and within 36 European study areas: Results from the ESCAPE study", *Atmospheric Environment*, 62, 374-390, 2012, [doi: 10.1016/j.atmosenv.2012.07.080](https://doi.org/10.1016/j.atmosenv.2012.07.080)
- 15) P. Kassomenos, S. Vardoulakis, A. Chaloulakou, A. Paschalidou, **G. Grivas**, R. Borge, J. Lumbreras: "Study of PM₁₀ and PM_{2.5} levels in three European cities: Analysis of inter- and intra-urban variations", *Atmospheric Environment*, 87, 153-163, 2014, [doi: 10.1016/j.atmosenv.2014.01.004](https://doi.org/10.1016/j.atmosenv.2014.01.004)
- 16) M. Wang, R. Beelen, T. Bellander, M. Birk, G. Cesaroni, M. Cirach, J. Cyrys, K. de Hoogh, C. Declercq, K. Dimakopoulou, M. Eeftens, K.T. Eriksen, F. Forastiere, C. Galassi, **G. Grivas**, (...), B. Brunekreef: "Performance of multi-city land use regression models for nitrogen dioxide and fine particles", *Environmental Health Perspectives*, 122, 843-849, 2014, [doi: 10.1289/ehp.1307271](https://doi.org/10.1289/ehp.1307271)
- 17) M.Y. Tsai, G. Hoek, T. Beregszaszi, G. Cesaroni, M. Cirach, J. Cyrys, K. de Hoogh, A. De Nazelle, F. de Vocht, C. Declercq, R. Ducret-Stich, M. Eeftens, C. Galassi, R. Grazuleviciene, T. Grazuleviciene, **G. Grivas**, (...), B. Brunekreef: "Spatial variation of PM elemental composition between and within 20 European study areas - Results of the ESCAPE project", *Environment International*, 84, 181-192, 2015, [doi: 10.1016/j.envint.2015.04.015](https://doi.org/10.1016/j.envint.2015.04.015)
- 18) E. Samoli, K. Dimakopoulou, D. Evangelopoulos, S. Rodopoulou, A. Karakatsani, L. Veneti, M. Sionidou, I. Tsolakoglou, I. Krasanaki, **G. Grivas**, D. Papakosta, K. Katsouyanni: "Is daily exposure to ozone associated with respiratory morbidity and lung function in a representative sample of schoolchildren? Results from a panel study in Greece", *Journal of Exposure Science and Environmental Epidemiology*, 27, 346-351, 2017, [doi: 10.1038/jes.2016.32](https://doi.org/10.1038/jes.2016.32)
- 19) K. Dimakopoulou, **G. Grivas**, E. Samoli, S. Rodopoulou, D. Spyrtatos, D. Papakosta, A. Karakatsani, A. Chaloulakou, K. Katsouyanni: "Determinants of personal exposure to ozone in school children. Results from a panel study in Greece", *Environmental Research*, 154, 66-72, 2017, [doi: 10.1016/j.envres.2016.12.020](https://doi.org/10.1016/j.envres.2016.12.020)
- 20) **G. Grivas***, K. Dimakopoulou, D. Papakosta, A. Karakatsani, K. Katsouyanni, A. Chaloulakou: "Ozone exposure assessment for children in Greece: Results from the RESPOZE study", *Science of the Total Environment*, 581-582, 518-529, 2017, [doi: 10.1016/j.scitotenv.2016.12.159](https://doi.org/10.1016/j.scitotenv.2016.12.159)
- 21) A. Karakatsani, E. Samoli, S. Rodopoulou, K. Dimakopoulou, D. Papakosta, D. Spyrtatos, **G. Grivas**, S. Tassi, N. Aggelis, A. Thirios, A. Tsiotsios, K. Katsouyanni: "Weekly personal ozone exposure and respiratory health in a panel of Greek schoolchildren", *Environmental Health Perspectives*, 125, 077016/1-12, 2017, [doi:10.1289/EHP635](https://doi.org/10.1289/EHP635)
- 22) N. Angelis, D. Spyrtatos, K. Domvri, K. Dimakopoulou, E. Samoli, G. Kalamaras, A. Karakatsani, **G. Grivas**, K. Katsouyanni, D. Papakosta: "Effect of ambient ozone exposure assessed by individual monitors on nasal function and exhaled NO among school children in the area of Thessaloniki,

- Greece”, *Journal of Occupational and Environmental Medicine*, 59, 509-515, 2017, [doi: 10.1097/JOM.0000000000001011](https://doi.org/10.1097/JOM.0000000000001011)
- 23) **G. Grivas***, S. Cheristanidis, A. Chaloulakou, P. Koutrakis, N. Mihalopoulos: “Elemental composition and source apportionment of fine and coarse particles at traffic and urban background locations in Athens, Greece”, *Aerosol and Air Quality Research*, 18, 1642-1659, 2018, [doi: 10.4209/aaqr.2017.12.0567](https://doi.org/10.4209/aaqr.2017.12.0567)
- 24) C. Theodosi, M. Tsagkaraki, P. Zarmas, **G. Grivas**, E. Liakakou, D. Paraskevopoulou, M. Lianou, E. Gerasopoulos, N. Mihalopoulos: “Multiyear chemical composition of the fine aerosol fraction in Athens, Greece, with emphasis on the contribution of residential heating in winter time”, *Atmospheric Chemistry and Physics*, 18, 14371-14391, 2018, [doi: 10.5194/acp-18-14371-2018](https://doi.org/10.5194/acp-18-14371-2018)
- 25) I. Stavroulas, A. Bougiatioti, **G. Grivas**, D. Paraskevopoulou, M. Tsagkaraki, P. Zarmas, E. Liakakou, E. Gerasopoulos, N. Mihalopoulos: “Sources and processes that control the submicron organic aerosol composition in an urban Mediterranean environment (Athens): a high temporal resolution chemical composition measurement study”, *Atmospheric Chemistry and Physics*, 19, 901-919, 2019, [doi: 10.5194/acp-19-901-2019](https://doi.org/10.5194/acp-19-901-2019)
- 26) **G. Grivas***, I. Stavroulas, E. Liakakou, D. Kaskaoutis, A. Bougiatioti, D. Paraskevopoulou, E. Gerasopoulos, N. Mihalopoulos: “Measuring the spatial variability of Black Carbon in Athens during wintertime”, *Air Quality Atmosphere and Health*, 12, 1405–1417, 2019, [doi: 10.1007/s11869-019-00756-y](https://doi.org/10.1007/s11869-019-00756-y)
- 27) K. Dimakopoulou, J. Douros, E. Samoli, A. Karakatsani, S. Rodopoulou, D. Papakosta, **G. Grivas**, G. Tsilingiridis, I. Mudway, N. Moussiopoulos, K. Katsouyanni: “Long-term exposure to ozone and children's respiratory health: Results from the RESPOZE study”, *Environmental Research*, 182, 109002, 2020, [doi: 10.1016/j.envres.2019.109002](https://doi.org/10.1016/j.envres.2019.109002)
- 28) E. Liakakou, I. Stavroulas, D. Kaskaoutis, **G. Grivas**, D. Paraskevopoulou, U.C. Dumka, M. Tsagkaraki, A. Bougiatioti, K. Oikonomou, J. Sciare, E. Gerasopoulos, N. Mihalopoulos: “Long-term variability, source apportionment and spectral properties of black carbon at an urban background site in Athens, Greece”, *Atmospheric Environment*, 222, 117137, 2020, [doi: 10.1016/j.atmosenv.2019.117137](https://doi.org/10.1016/j.atmosenv.2019.117137)
- 29) E. Liakakou, D. Kaskaoutis, **G. Grivas**, I. Stavroulas, M. Tsagkaraki, D. Paraskevopoulou, A. Bougiatioti, E. Gerasopoulos, N. Mihalopoulos: “Long-term brown carbon spectral characteristics in a Mediterranean city (Athens)”, *Science of the Total Environment*, 708, 135019, 2020, [doi: 10.1016/j.scitotenv.2019.135019](https://doi.org/10.1016/j.scitotenv.2019.135019)
- 30) D. Kaskaoutis, **G. Grivas**, C. Theodosi, M. Tsagkaraki, D. Paraskevopoulou, I. Stavroulas, E. Liakakou, A. Gkikas, N. Hatzianastassiou, C. Wu, E. Gerasopoulos, N. Mihalopoulos: “Carbonaceous aerosols in contrasting atmospheric environments in Greek Cities: Evaluation of the EC-tracer methods for secondary organic carbon estimation”, *Atmosphere*, 11, 161, 2020, [doi: 10.3390/atmos11020161](https://doi.org/10.3390/atmos11020161)
- 31) P. Kalkavouras, A. Bougiatioti, **G. Grivas**, I. Stavroulas, N. Kalivitis, E. Liakakou, E. Gerasopoulos, C. Pilinis, N. Mihalopoulos: “On the regional aspects of new particle formation in the Eastern Mediterranean: a comparative study between a background and an urban site based on long term observations”, *Atmospheric Research*, 239, 104, 911, 2020, [doi: 10.1016/j.atmosres.2020.104911](https://doi.org/10.1016/j.atmosres.2020.104911)
- 32) S. Cheristanidis, **G. Grivas**, A. Chaloulakou: “Determination of total and lung-deposited particle surface area concentrations, in central Athens, Greece”, *Environmental Monitoring and Assessment*, 192, 62, 2020, [doi: 10.1007/s10661-020-08569-8](https://doi.org/10.1007/s10661-020-08569-8)
- 33) I. Stavroulas, **G. Grivas***, P. Michalopoulos, E. Liakakou, A. Bougiatioti, P. Kalkavouras, K.M. Fameli, N. Hatzianastassiou, N. Mihalopoulos, E. Gerasopoulos: “Field evaluation of low-cost PM sensors (Purple Air PA-II) under variable urban air quality conditions, in Greece”, *Atmosphere*, 11, 926, 2020, [doi: 10.3390/atmos11090926](https://doi.org/10.3390/atmos11090926)
- 34) **G. Grivas***, E. Athanasopoulou, A. Kakouri, J. Bailey, E. Liakakou, I. Stavroulas, P. Kalkavouras, A. Bougiatioti, D. Kaskaoutis, M. Ramonet, N. Mihalopoulos, E. Gerasopoulos: “Integrating in situ measurements and city scale modelling to assess the COVID–19 lockdown effects on emissions and air quality in Athens, Greece”, *Atmosphere*, 11, 1174, 2020, [doi: 10.3390/atmos11111174](https://doi.org/10.3390/atmos11111174)
- 35) K. Dimitriou, **G. Grivas**, E. Liakakou, E. Gerasopoulos, N. Mihalopoulos: “Assessing the contribution

- of regional sources to urban air pollution by applying 3D-PSCF modeling”, *Atmospheric Research*, 248, 10518, 2021, [doi: 10.1016/j.atmosres.2020.105187](https://doi.org/10.1016/j.atmosres.2020.105187)
- 36) R. Dahmardeh Behrooz, D. Kaskaoutis, **G. Grivas**, N. Mihalopoulos: “Human health risk assessment for toxic elements in the extreme ambient dust conditions observed in Sistan, Iran”, *Chemosphere*, 262, 127835, 2021, [doi: 10.1016/j.chemosphere.2020.127835](https://doi.org/10.1016/j.chemosphere.2020.127835)
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- 8) A. Kakouri, M. Ramacher, E. Athanasopoulou, **G. Grivas**, O. Speyer, M. Karl, T. Kontos, E. Gerasopoulos: "A GIS - based tool in service of high resolution air quality mapping", *Scientific Conference on Geography of the University of the Aegean*, 2-4 June 2021 (online conference).
- 9) G. Veratti, I. Stavroulas, A. Bigi, **G. Grivas**, P. Kalkavouras, D. Paraskevopoulou, E. Liakakou, A. Bougiatioti, O. Speyer, C. Chatzidiakos, E. Gerasopoulos, M. Stortini, G. Ghermandi, E., Gerasopoulos, N. Mihalopoulos. "Mappatura della variabilità urbana di Black e Brown Carbon nella città di Atene", *X Convegno sul Particolato Atmosferico*, 18-20 May 2022, Bologna, IT, p. 3-A-6.

C2. Recognition of Research Work

i) Impact (source: 2020 Journal Impact Factors, Clarivate Analytics)

47 articles in international peer-reviewed journals (8 as first author, 18 as second author, 9 as corresponding author) with an average Journal Impact Factor: 5,05

ii) Citations (source: Scopus, June 2022)

2100 citations (excluding self-citations of author) to 47 journal articles

Average citation number per article: 44,7

h-index: 22, *h*-10: 29

iii) Selection as reviewer

Reviewer in more than 80 articles for 25 journals, including *Environmental Science and Technology*, *Environment International*, *Environmental Pollution*, *Science of the Total Environment*, *Atmospheric Chemistry and Physics*, *Atmospheric Environment* etc.

D. Teaching Experience

School of Chemical Engineering, National Technical University of Athens

- 1) *Industrial Health and Safety* (2004-2012): Teaching assistant, tutoring, educational software development and preparation of educational material.
- 2) *Design of Pollution Control Installations* (2006-2007): Teaching assistant, preparation of educational material.
- 3) *Risk Assessment and Management* (2008-2009): Teaching assistant, preparation of educational material.
- 4) *Environmental Engineering* (2011-2012): Teaching assistant

M.Sc. "Energy Management and Environmental Protection Systems", NTUA – Univ. Piraeus

- *Safety and Health in the Workplace* (2005-2010): Teaching assistant and laboratory tutoring