Jibran Khan

Atmospheric scientist working on numerical modelling and physics-informed, data-driven methods

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ORCID · Google Scholar · Web of Science · Scopus · ResearchGate · Zenodo · LinkedIn · GitHub · Portfolio

Profile

I am a computational environmental scientist at Aarhus University. I develop numerical models, data assimilation and physics-informed machine learning for air pollution and environmental noise, combining physical process models with satellite, in situ and mobile observations. I build operational systems used by authorities and the public, and lead externally funded research in Denmark and Europe.

h-index: 23 (Web of Science), 28 (Google Scholar). Citations: 2,216 (Web of Science), 3,614 (Google Scholar). As of 10 October 2026.

Current research focus

- Physics-informed and data-driven environmental modelling, including physics-informed neural networks
- Data assimilation, inverse modelling of emissions and uncertainty quantification
- Atmospheric dispersion across scales, from street canyons to national exposure models (Gaussian, box, Lagrangian, Eulerian, CFD)
- Integration of satellite, in situ and mobile observations into modelling frameworks
- Operational air quality forecasting and scientific software at national scale
- Environmental noise modelling and assessment
- Machine learning for atmospheric composition, noise and exposure modelling
- Climate and air quality interactions, and greenhouse gas monitoring

Experience

2024–present **Docent (Associate Professor)**
Department of Environmental and Biological Sciences, University of Eastern Finland, Kuopio, Finland

- Teaching, research collaboration and doctoral supervision.

2023–present **Researcher (Assistant Professor)**
Department of Environmental Science, Aarhus University, Roskilde, Denmark

- Developed core scientific and software components of ByensLuft, Copenhagen's operational air quality forecasting platform with 4-day forecasts, used by more than 17,000 citizens through web and mobile apps (Python, PostgreSQL/PostGIS, PostgREST).
- Developed and applied national and street-scale dispersion models (AirGIS, OSPM, OML, OML-Highway), producing pollution maps for all state roads in Denmark.
- Lead a Google Research Scholar project on physics-informed neural networks for hyperlocal ultrafine particle prediction.
- Led the first systematic evaluation of the Nordic and European road traffic noise standards Nord2000, RTN-96 and CNOSSOS-EU against field measurements in Denmark.
- Led exposure assessment for national Danish cohort studies on air pollution, noise and health, contributing to more than 20 peer-reviewed publications.

2019–2022 **Postdoctoral Fellow**
Department of Environmental Science, Aarhus University, Roskilde, Denmark

- Co-developed methods for hyperlocal mapping of nitrogen dioxide, black carbon and ultrafine particles with Google Street View cars in Amsterdam and Copenhagen. Results are public in Google's Environmental Insights Explorer (Air Quality Labs).
- Generated address-level exposure estimates with AirGIS for large Danish population cohorts.
- Evaluated low- and mid-cost air quality sensors, contributing to published guidance on sensor performance and deployment.

2016–2018 **PhD Fellow**
Department of Environmental Science, Aarhus University, Roskilde, Denmark

- Developed and validated a new generation of AirGIS, Denmark's national GIS-based dispersion and exposure modelling system, rebuilt on open-source PostgreSQL/PostGIS for national-scale applications.
- Extended AirGIS to environmental noise, creating a combined air pollution and noise modelling framework.

2017 **Visiting Researcher (PhD research stay)**
Department of Chemical Engineering, Texas A&M University at Qatar, Doha, Qatar

2013–2015 **Lecturer in Physics and Engineering Physics**
Dawood University of Engineering and Technology, Karachi, Pakistan

2011–2013 **Lecturer**
Pakistan Air Force Degree College, Karachi, Pakistan

Education

2019 **PhD in Environmental Science (Atmospheric Modelling)**
Department of Environmental Science, Aarhus University, Denmark
Thesis: Air Quality and Noise Exposure Modelling System.

2015 **MPhil in Space Science**
Institute of Space and Planetary Astrophysics, University of Karachi, Pakistan
Thesis: GIS Analysis of Renewable Solar Energy and its Sustainable Development for Karachi.

2007 **MSc in Applied Physics**
Department of Applied Physics, University of Karachi, Pakistan

Grants

Main applicant or principal investigator

2026–2028 **CAMS-MIND: Exploring the links between air pollution, heat and mental health through CAMS data integration**
Copernicus Atmosphere Monitoring Service (CAMS), ECMWF
Main applicant. EUR 300,000.

2025–2026 **Physics-informed neural networks for hyperlocal ultrafine particle prediction**
Google Research Scholar Award
Principal investigator and project manager. USD 60,000.

2024–2027 **MI-TRAP: Mitigating Traffic-Related Air Pollution and Noise**
Horizon Europe
Aarhus University principal investigator and project manager. DKK 2.6 million (Aarhus University budget).

2024–2025 **The Childhood Environment and Cognition Study (road traffic noise)**
University of Southern Denmark
Principal investigator and project manager. DKK 250,000.

2024–2025 **Nationwide calculation of traffic noise in Denmark**
AU Health, Aarhus University
Principal investigator and project manager. DKK 130,000.

2023–2024 **NoiseCARD: Noise and Cardiovascular Diseases**
Odense University Hospital
Principal investigator and project manager. DKK 250,000.

2023 **AI4TEN: Artificial Intelligence for Transport and Environmental Noise**
Danish Ministry of Higher Education and Science
Principal investigator and project manager. DKK 53,000.

Co-applicant and work package lead

2025–2029 **EXPOSIM, exposure to air pollution and noise and immune health**
Horizon Europe
Work package 2 co-lead. About EUR 736,000.

2024–2027 **Copernicus Atmosphere Monitoring Service National Collaboration Programme, Denmark (CAMS2-72-DK-Bis)**
CAMS and ECMWF
Work package 6 lead, communication and outreach. DKK 2.9 million (Aarhus University budget).

Publications

75 publications: 59 journal articles, 8 conference proceedings, 1 book chapters, 7 reports. Full list with links: jibrankhan.net/cv/publications/

Journal articles

59. **Khan, J.** (2026). AI4TEN: Fine-Tuning Pre-Trained Audio Transformers (BEATs, AST) for Cross-Dataset Acoustic Vehicle Classification with Domain Adaptation. *Acoustics, 8(3), 63*. DOI · Code and data

58. Šulc, L., Martínez, N. S., Wu, F., Sjöström, M., Pasanen, T. P., Tiittanen, P., ..., **Khan, J.**, ... & Selander, J. (2026). Occupational Noise Exposure During Pregnancy and Birth Outcomes: A Large-Scale Cohort Study in Nordic Countries. *Environmental Research, 125602*. DOI

57. **Khan, J.**, Ryzhikov, I., & Kolehmainen, M. (2026). AI4TEN: Synthetic-to-Real Transfer for Acoustic Vehicle Classification Using Physics-Based and AI-Generated Training Data. *Applied Sciences, 16(14), 7234*. DOI · Code and data

56. **Khan, J.**, Keller, R., & Nordstrøm, C. (2026). Hybrid Machine Learning and Data Assimilation for Street-Level NO_2 and $PM_{2.5}$ Prediction in Copenhagen, Denmark (2001–2018). *Atmosphere, 17(7), 647*. DOI

55. Birinci, E., Özdemir, H., Özdemir, E. T., Deniz, A., & **Khan, J.** (2026). Part A: Data Collection, Processing, and Characterization of a High-Resolution Dataset for Street-Scale Air Quality Modeling in Barbaros Street, Beşiktaş, Istanbul. *Atmosphere, 17(7), 681*. DOI

54. Dolšak Lavrič, P., Bec, D., Ciglenečki, D., Orgin, M., Turšič, J., Stegnar, G., **Khan, J.**, & Kukec, A. (2026). Development of an hourly bottom-up emission inventory to assess air pollution dispersion with GRAMM/GRAL in complex terrain. *Air Quality, Atmosphere & Health, 19, 102*. DOI

53. Fleischer, N. L., Flachs, E. M., Ketzel, M., Brandt, J., **Khan, J.**, Gustavsson, P., ... & Wils, R. S. (2026). Long-term exposure to ambient air pollution and risk of incident acute myocardial infarction in a nationwide register-based cohort study. *International Archives of Occupational and Environmental Health, 99(2), 9*. DOI

52. Bagkis, E., Hassani, A., Schneider, P., DeSouza, P., Shetty, S., Kassandros, T., ... & **Khan, J.** (2025). Evolving trends in application of low-cost air quality sensor networks: challenges and future directions. *npj Climate and Atmospheric Science, 8(1), 335*. Senior and corresponding author. DOI

51. Kerckhoffs, J.*, Hofman, J.*, **Khan, J.**, Adams, M. D., Blanco, M. N., deSouza, P., ... & Amini, H. (2025). Mobile monitoring of air pollution: a position paper on use cases, good practices, challenges, and opportunities. *Environment International, 202, 109582*. DOI

50. Jensen, S. S., Ketzel, M., **Khan, J.**, Valencia, V. H., Brandt, J., Christensen, J. H., ... & Ellermann, T. (2025). Air Quality at Your Street 2.0: Air Quality Modelling for All Streets in Denmark. *Atmosphere, 16(12), 1346*. DOI

49. Mayntz, S. P., Warncke, S., Ladefoged, L. G., Mohamed, R. A., Mejldal, A., Lindholt, J. S., ..., **Khan, J.** & Lambrechtsen, J. (2025). Do $PM_{2.5}$ pollution peaks matter? Examining cardiovascular risk in the AIRCARD study. *European Heart Journal, 46, ehaf784-1946*. DOI

48. Mohamed, R. A., Peronard Mayntz, S., Møller, J. J. K., Mejldal, A., Schultz Overgaard, K., Rueskov Andersen, T., Madsen, F.S., Frohn, L.M., Brandt, J., Ketzel, M., **Khan, J.**, ... & Lambrechtsen, J. (2025). Long-term ambient air pollution exposure and coronary calcium score in men: insights from the DANCAVAS study. *European Journal of Preventive Cardiology, zwaf688*. DOI

47. Wils, R. S., Nielsen, H. B., Flachs, E. M., Andersen, A. J., Dreyer, L. W., Ketzel, M., Brandt, J., **Khan, J.**, ... & Hougaard, K. S. (2025). Air pollution and risk of rheumatoid arthritis: a Danish register-based cohort study. *Environmental Toxicology and Pharmacology, 104855*. DOI

46. Mayntz, S. P., Mohamed, R. A., Mejldal, A., Møller, J. J. K., Lindholt, J. S., Diederichsen, A. C. P., ..., **Khan, J.**, & Lambrechtsen, J. (2025). Association Between Long-Term Fine Particulate Matter Exposure and Incident Type 2 Diabetes in a Low-Exposure Danish Cohort: An AIRCARD Analysis. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews, 103298*. DOI

45. Mayntz, S. P., Mohamed, R. A., Mejldal, A., Møller, J. J. K., Lindholt, J. S., Diederichsen, A. C., ... , **Khan, J.**, & Lambrechtsen, J. (2025). Long-Term Road Traffic Noise, Air Pollution, and Cardiovascular Disease AIRCARD: A Prospective Cohort Study. *JACC: Advances, 4(6_Part_1), 101787*. Full text

44. Sonnenschein, T. S., Yuan, Z., **Khan, J.**, Kerckhoffs, J., Vermeulen, R. C., & Scheider, S. (2025). Hybrid cellular automata-based air pollution model for traffic scenario microsimulations. *Environmental Modelling & Software, 186, 106356*. DOI

43. Khanh, H. N. T., Stafoggia, M., Sørensen, M., Poulsen, A. H., Raaschou-Nielsen, O., **Khan, J.**, ... & de Bont, J. (2025). Exploring the interaction between ambient air pollution and road traffic noise on stroke incidence in ten Nordic cohorts. *Environment International, 198, 109403*. DOI

42. Wesselink, A. K., Johannesen, B. R., Wang, T. R., Ketzel, M., Mikkelsen, E. M., Brandt, J., **Khan, J.**, ... & Hatch, E. E. (2025). Residential Exposure to $PM_{2.5}$ Constituents and Fecundability in a Danish Preconception Cohort. *Paediatric and Perinatal Epidemiology, 39(3), 256-261*. DOI

41. Pasanen, T. P., Tiittanen, P., Roswall, N., Waye, K. P., Selander, J., Martinez, N. S., ..., **Khan, J.**, &.. Lanki, T. (2025). Occupational noise exposure and maternal pregnancy complications: register-based cohort from urban areas in four Nordic countries. *Occupational and Environmental Medicine*. DOI

40. Pedersen, M., Liu, S., Andersen, Z. J., Nybo Andersen, A.-M., Brandt, J., ... **Khan, J.**, ... & Loft, S. (2024). Birth Cohort Studies of Long-term Exposure to Ambient Air Pollution in Early Life and Development of Asthma in Children and Adolescents from Denmark. *Health Effects Institute*. Full text

39. Sørensen, M., Poulsen, A. H., Nøhr, B., **Khan, J.**, Ketzel, M., Brandt, J., ... & Jensen, A. (2024). Long term exposure to road traffic noise and air pollution and risk of infertility in men and women: nationwide Danish cohort study. *BMJ, 386*. DOI

38. Yuan, Z., Kerckhoffs, J., Li, H., **Khan, J.**, Hoek, G., & Vermeulen, R. (2024). Hyperlocal Air Pollution Mapping: A Scalable Transfer Learning LUR Approach for Mobile Monitoring. *Environmental Science & Technology, 58(32), 14372-14383*. DOI

37. Stepien, E. N., **Khan, J.**, Galatius, A., & Teilmann, J. (2024). How low can you go? Exploring impact of drones on haul out behaviour of harbour-and grey seals. *Frontiers in Marine Science, 11, 1411292*. DOI

36. Amini, H., Bergmann, M. L., Shahri, S. M. T., Tayebi, S., Cole-Hunter, T., Kerckhoffs, J., **Khan, J.**, ... & Schwartz, J. (2024). Harnessing AI to unmask Copenhagen's invisible air pollutants: A study on three ultrafine particle metrics. *Environmental Pollution, 123664*. DOI

35. **Khan, J.**, Thysell, E., Backalarz, C., Finne, P., Hertel, O., & Jensen, S. S. (2023). Performance Evaluation of Nord2000, RTN-96 and CNOSSOS-EU against Noise Measurements in Central Jutland, Denmark. *Acoustics, 5(4), 1099–1122*. DOI

34. Tayebi, S., Kerckhoffs, J., **Khan, J.**, de Hoogh, K., Chen, J., Shahri, S. M. H., Bergmann, M. L., Cole-Hunter, T., Lim, Y.H., Mortensen, L. M., Hertel, O., Reeh, R., Schwartz, J., Hoek, G., Vermeulen, R., Andersen, Z. J., Loft, S. and Amini, H. (2023). Comparison of NO_2 and BC Predictions Estimated Using Google Street View-Based and Conventional European-Wide LUR Models in Copenhagen, Denmark. *Atmosphere, 14(11), 1602*. DOI

33. Frederickson, L. B., Russell, H. S., Fessa, D., **Khan, J.**, Schmidt, J. A., Johnson, M. S., & Hertel, O. (2023). Hyperlocal air pollution in an urban environment measured with low-cost sensors. *Urban Climate, 52, 101684*. DOI

32. Harbo Poulsen, A., Sørensen, M., Hvidtfeldt, U. A., Ketzel, M., Christensen, J. H., Brandt, J., ... **Khan, J.**, ... & Raaschou-Nielsen, O. (2023). Concomitant exposure to air pollution, green space and noise, and risk of myocardial infarction. A cohort study from Denmark. *European Journal of Preventive Cardiology*. DOI

31. Horsdal, H. T., Pedersen, M. G., Schullehner, J., Østergaard, C. S., Mcgrath, J. J., Agerbo, E., ... **Khan, J.**, ... & Pedersen, C. B. (2023). Perspectives on environment and health research in Denmark. *Scandinavian Journal of Public Health*. DOI

30. Pedersen, M., Liu, S., Zhang, J., Jovanovic Andersen, Z., Brandt, J., Budtz- Jørgensen, E.,. **Khan, J.**, ... & Loft, S. (2023). Early-Life Exposure to Ambient Air Pollution from Multiple Sources and Asthma Incidence in Children: A Nationwide Birth Cohort Study from Denmark. *Environmental Health Perspectives, 131(5), 057003*. DOI

29. Poulsen, A. H., Sørensen, M., Hvidtfeldt, U. A., Ketzel, M., Christensen, J. H., Brandt, J., **Khan, J.**, ... & Raaschou-Nielsen, O. (2023). Air pollution and stroke: effect modification by sociodemographic and environmental factors. A cohort study from Denmark. *International Journal of Hygiene and Environmental Health, 251, 114165*. DOI

28. Nunez, Y., Balalian, A., Parks, R. M., He, M. Z., Hansen, J., Raaschou-Nielsen, O., **Khan, J.**, ... & Kioumourtzoglou, M. A. (2023). Exploring Relevant Time Windows in the Association Between $PM_{2.5}$ Exposure and Amyotrophic Lateral Sclerosis: A Case-Control Study in Denmark. *American Journal of Epidemiology, kwad099*. DOI

27. Poulsen, A. H., Sørensen, M., Hvidtfeldt, U. A., Frohn, L. M., Ketzel, M., Christensen, J. H., **Khan, J.**, ... & Raaschou-Nielsen, O. (2023). Air pollution and myocardial infarction: effect modification by sociodemographic and environmental factors. A cohort study from Denmark. *Environmental Research, 229, 115905*. DOI

26. Sørensen, M., Raaschou-Nielsen, O., Poulsen, A. H., Hvidtfeldt, U. A., Brandt, J., **Khan, J.**, ... & Thacher, J. D. (2023). Long-term exposure to residential transportation noise and mortality: A nationwide cohort study. *Environmental Pollution, 328, 121642*. DOI

25. Roswall, N., Thacher, J. D., Ögren, M., Pyko, A., Åkesson, A., Oudin, A., **Khan, J.**, ... & Sørensen, M. (2023). Long-term exposure to traffic noise and risk of incident colon cancer: A pooled study of eleven Nordic cohorts. *Environmental Research, 224, 115454*. DOI

24. Kerckhoffs, J.*, **Khan, J.***, Hoek, G., Yuan, Z., Hertel, O., Ketzel, M., ... & Vermeulen, R. (2022). Hyperlocal variation of nitrogen dioxide, black carbon, and ultrafine particles measured with Google Street View cars in Amsterdam and Copenhagen. *Environment International, 170, 107575*. Shared first author. DOI

23. Thacher, J. D., Poulsen, A. H., Raaschou-Nielsen, O., Hvidtfeldt, U. A., Brandt, J., Christensen, J. H., **Khan, J.**, ... & Sørensen, M. (2022). Exposure to transportation noise and risk for cardiovascular disease in a nationwide cohort study from Denmark. *Environmental Research, 113106*. DOI

22. Erdmann, F., Raaschou-Nielsen, O., Hvidtfeldt, U.A., Ketzel, M., Brandt, J., **Khan, J.**, Schüz, J., & Sørensen, M. (2022). Residential road traffic and railway noise and risk of childhood cancer: A nationwide register-based case-control study in Denmark. *Environmental Research*. DOI

21. Thacher, J.D., Roswall, R., Lissåker, C., Aasvang, G.M., Albin, M., Andersson, E. M., Engström, G., Eriksson, E., Hvidtfeldt, U.A., Ketzel, M., **Khan, J.**, Lanki, T., ... , Ögren, M., Selander, J. & Sørensen M. (2022). Occupational noise exposure and risk of incident stroke: a pooled study of five Scandinavian cohorts. *Occupational and Environmental Medicine*. DOI

20. Kerckhoffs, J., **Khan, J.**, Hoek, G., Yuan, Z., Ellermann, T., Hertel, O., Ketzel, M., Jensen, S.S., Meliefste, K., Vermeulen, R. (2022). A Mixed-effects Modelling Framework for Amsterdam and Copenhagen for Outdoor NO_2 Concentrations using Measurements Sampled with Google Street View Cars. *Environmental Science & Technology, 56(4), 2011–2020*. DOI

19. Bergmann, M. L., Andersen, Z. J., Amini, H., **Khan, J.**, Lim, Y. H., Loft, S., ... & Cole-Hunter, T. (2022). Ultrafine particle exposure for bicycle commutes in rush and non-rush hour traffic: A repeated measures study in Copenhagen, Denmark. *Environmental Pollution, 294, 118631*. DOI

18. Sørensen, M., Hvidtfeldt, U. A., Poulsen, A. H., Thygesen, L. C., Frohn, L. M., Ketzel, M., Christensen, J., Brandt, J., **Khan, J.** & Raaschou-Nielsen, O. (2022). The effect of adjustment to register-based and questionnaire-based covariates on the association between air pollution and cardiometabolic disease. *Environmental Research, 203, 111886*. DOI

17. **Khan, J.**, Ketzel, M., Jensen, S. S., Gulliver, J., Thysell, E., & Hertel, O. (2021). Comparison of Road Traffic Noise prediction models: CNOSSOS-EU, Nord2000 and TRANEX. *Environmental Pollution, 270, 116240*. DOI

16. Wesselink, A. K., Wang, T. R., Ketzel, M., Mikkelsen, E. M., Brandt, J., **Khan, J.**, ... & Hatch, E. E. (2021). Air pollution and fecundability: Results from a Danish preconception cohort study. *Pediatric and Perinatal Epidemiology, 36(1), 57-67*. DOI

15. Cantuaria, M.L., Waldorff, F.B., Wermuth, L., Pedersen, E.R., Poulsen, A.H., Thacher, J., Raaschou-Nielsen, O., Ketzel, M., Christensen, J., **Khan, J.**, Valencia, V.H., Schmidt, J., Sørensen, M. (2021). Residential exposure to transportation noise and incidence of dementia: a national cohort study. *BMJ, 374, n1954*. DOI

14. Ketzel, M., Frohn, L. M., Christensen, J. H., Brandt, J., Massling, A., Andersen, C., Im, U., Jensen, S.S., **Khan, J.**, Nielsen, O-K., Plejdrup, ... & Raaschou-Nielsen, O. (2021). Modelling ultrafine particle number concentrations at address resolution in Denmark from 1979 to 2018-Part 2: Local and street scale modelling and evaluation. *Atmospheric Environment, 264, 118633*. DOI

13. Thacher, J.D., Poulsen, A.H., Hvidtfeldt, U.A., Raaschou-Nielsen, O., Brandt, J., Geels, C., **Khan, J.**, Münzel, J., Sørensen, M (2021). Long-term exposure to transportation noise and risk for type 2 diabetes in a nationwide cohort study from Denmark. *Environmental Health Perspectives, 129(12), 127003*. DOI

12. Scholten, R. H., Møller, P., Andersen, Z. J., Dehlendorff, C., **Khan, J.**, Brandt, J., ... & Mathiesen, L. (2021). Telomere length in newborns is associated with exposure to low levels of air pollution during pregnancy. *Environment International, 146, 106202*. DOI

11. **Khan, J.**, Kakosimos, K., Jensen, S. S., Hertel, O., Sørensen, M., Gulliver, J., & Ketzel, M. (2020). The spatial relationship between traffic-related air pollution and noise in two Danish cities: Implications for health-related studies. *Science of the Total Environment, 726, 138577*. DOI

10. **Khan, J.**, Kakosimos, K., Raaschou-Nielsen, O., Brandt, J., Jensen, S. S., Ellermann, T., & Ketzel, M. (2019). Development and performance evaluation of new AirGIS: a GIS-based air pollution and human exposure modelling system. *Atmospheric Environment, 198, 102-121*. DOI

9. Hvidtfeldt, U. A., Geels, C., Sørensen, M., Ketzel, M., **Khan, J.**, Tjønneland, A., ... & Raaschou-Nielsen, O. (2019). Long-term residential exposure to $PM_{2.5}$ constituents and mortality in a Danish cohort. *Environment International, 133, 105268*. DOI

8. **Khan, J.**, Ketzel, M., Kakosimos, K., Sørensen, M., & Jensen, S. S. (2018). Road traffic air and noise pollution exposure assessment: A review of tools and techniques. *Science of the Total Environment, 634, 661-676*. DOI

7. Hvidtfeldt, U. A., Sørensen, M., Geels, C., Ketzel, M., **Khan, J.**, Tjønneland, A., ... & Raaschou-Nielsen, O. (2018). Long-term residential exposure to $PM_{2.5}$, PM_{10}, black carbon, NO_2, and ozone and mortality in a Danish cohort. *Environment International, 123, 265-272*. DOI

6. Hvidtfeldt, U. A., Ketzel, M., Sørensen, M., Hertel, O., **Khan, J.**, Brandt, J., & Raaschou-Nielsen, O. (2018). Evaluation of the Danish AirGIS air pollution modeling system against measured concentrations of $PM_{2.5}$, PM_{10}, and black carbon. *Environmental Epidemiology, 2(2), e014*. DOI · Full text

5. **Khan, J.**, & Arsalan, M. H. (2016). Solar power technologies for sustainable electricity generation: A review. *Renewable and Sustainable Energy Reviews, 55, 414-425*. DOI

4. **Khan, J.**, & Arsalan, M. H. (2016). Estimation of rooftop solar photovoltaic potential using geo-spatial techniques: A perspective from planned neighborhood of Karachi–Pakistan. *Renewable Energy, 90, 188-203*. DOI

3. **Khan, J.** & Arsalan, M. H. (2016). Implementation of Open-Source GIS Tools to Identify Bright Rooftops for Solar Photovoltaic Applications: A Case Study of Creek Lanes, DHA, Karachi. *Journal of Basic and Applied Sciences, 12, 14–22*. Full text · Publisher page · Full text

2. **Khan, J.**, & Qazi, W.A. (2016). On the Use of ALOS-PALSAR Mosaics to Study Ocean Surface Features of Pakistan Coastal Region. *Journal of Space Technology, 4(1)*. DOI

1. **Khan, J.** (2013). Preliminary Results - Hyperspectral Image Analysis for Dolomite Identification in Tarbela Dam Region of Pakistan. *International Journal of Innovative Technology and Exploring Engineering, 2(3), 30–34*. DOI

Conference proceedings

8. Baklanov, A., Christensen, J. H., Yu, S., Coll, I., Costes, M., Li, P., ..., **Khan, J.**, Jensen, S. S., Sahyoun, M., & Nuterman, R (2026). Integrated Systems and Analysis of Urban Mobility for Climate-Neutral and Sustainable Cities in Europe and China (IMTECC). *In: Mensink, C., Im, U. (eds) Air Pollution Modeling and Its Application XXX. ITM 2024. Springer Proceedings in Complexity. Springer, Cham*. DOI

7. **Khan, J.**, Aumond, P., & Can, A. (2024). Data assimilation for noise mapping using CNOSSOS – A Danish case study. *InterNoise 2024, Nantes, France (August 2024)*. DOI

6. Kærsaa, L., Gisladottir, A., & **Khan, J.** (2024). Case-study analysis of traffic noise at Vesterbrogade, Aarhus, Denmark. *Presented at InterNoise 2024, Nantes, France*. DOI

5. **Khan, J.** & Bertagnolio, F. (2023). Assessment of Road Traffic Noise in a Danish City Using Mobile Monitoring and Statistical Modelling Approaches. *Forum Acusticum 2023, 10th Convention of the European Acoustics Association, Torino, Italy*. DOI

4. **Khan, J.**, Ellermann, T., & Hertel, O. (2022). Predicting hourly street-scale NO_2 and $PM_{2.5}$ concentrations using machine learning at one of Danish traffic hotspots. *In: Mensink, C., Jorba, O. (eds) Air Pollution Modeling and Its Application XXVIII. Springer Proceedings in Complexity. Springer, Cham*. DOI

3. **Khan, J.**, Bertagnolio, F., & Hertel, O. (2021). Cyclists' Road Traffic Noise Exposure: Highlights of Bike-to-Work Noise Measurements Campaign under Corona Lockdown in a Danish City. *EuroNoise 2021, European Acoustics Association and Portuguese Acoustical Society, Madeira, Portugal (online)*. DOI

2. **Khan, J.** & Hertel, O. (2021). A Dynamic Activity-based Modelling approach to Estimate Exposure to Air Pollution: Some Results of Recent Experiments in Copenhagen, Denmark. *HARMO 20, 20th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Tartu, Estonia (online)*. DOI

1. **Khan, J.**, Poulsen, M.B., Ketzel, M.; Ørby, P.V., Christensen, J.H.; Dalgaard, R., Sabel, C., Hertel, O. (2019). Estimation of Exposure to Air Pollution in Denmark – A Step towards Activity-based Dynamic Exposure Assessment Framework. *HARMO 19, 19th International Conference on Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes, Bruges, Belgium*. DOI

Book chapters

1. Sabel, C., Amegbor, P.M., Zhang, Z., Chen, K., Poulsen, M.B., Hertel, O., Sigsgaard, T., Horsdal, H.T, Pedersen, C.B., & **Khan, J.** (2021). Urban Health and Wellbeing. *In: Shi, W., Goodchild, M., Batty, M., Kwan, M.-P. (eds) Urban Informatics. Springer*. Full text

Reports

7. Jensen, S.S., Ketzel, M., **Khan, J.**, & Christensen, J.H. (2026). Integration af Tårnby Kommune i prognosesystemet Byens Luft. *Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. Fagligt notat nr. 43*. Full text

6. Lansø, A.S. & **Khan, J.** (2026). Opdatering af indlæsning af terrændata i OML-Multi. *Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. Fagligt notat nr. 2026|15*. Full text

5. Lansø, A. S., Winther, M., & **Khan, J.** (2025). Impacts of onshore power installation in four Baltic Sea ports: emissions of air pollutants and greenhouse gases, air pollution and noise. *Aarhus University, DCE – Danish Centre for Environment and Energy. Scientific Report No. 637*. Full text

4. Jensen, S. S., **Khan, J.**, Christensen, J.H., Ketzel, M., Hansen, K.M., Andersen, C., Brandt, J., Ellermann, T. (2025). Prognose- og varslingssystem for luftkvalitet i Københavns Kommune (in Danish with English summary). *Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. Videnskabelig rapport nr. 636*. Full text

3. Jensen, S.S., Ketzel, M., **Khan, J.** (2023). Kortlægning af luftkvalitet langs statsvejene i Danmark (in Danish with English summary). *Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi. Videnskabelig rapport nr. 537*. Full text

2. Jensen, S.S., Ketzel, M., **Khan, J.**, Valencia, V.V., ..., Ellermann, T. (2021). Luften på din vej (Air Quality on Your Street: national air quality mapping, in Danish with English summary). *Aarhus University, DCE – Danish Centre for Environment and Energy*. Full text

1. Ellermann, T., **Khan, J.**, Ketzel, M., Jensen, S.S. & Hertel, O. (2021). Air View data on the spatial distribution of air pollution in Copenhagen. *Aarhus University, DCE – Danish Centre for Environment and Energy. Scientific note No. 2021/40*. Full text

Talks

2026 **Predicting hourly ultrafine particle concentrations in Copenhagen using data-driven methods: an ML-driven operational nowcasting pipeline**
15th International Conference on Air Quality, Prague, Czech Republic
Khan, J., Pereira, L.G., Singh, R., Thürkow, M., Schaap, M., Ketzel, M., Jensen, S.S., & Massling, A.

Selected oral presentations

2025 **Short-term air pollution information and forecasting system for Copenhagen**
HARMO 23, Hamburg, Germany

2025 **Automated traffic and noise monitoring with machine learning and AI: insights from recent experiments**
Acousticians' Day, Copenhagen, Denmark

2024 **Inverse modelling of fine and ultrafine particle emission factors: a case study in Copenhagen, Denmark**
14th International Conference on Air Quality, Helsinki, Finland

2024 **Case-study analysis of traffic noise at Vesterbrogade, Denmark**
InterNoise 2024, Nantes, France

2023 **A novel model system to estimate near real-time personal exposure to hyperlocal air pollution**
ISES Annual Meeting, Chicago, USA

2023 **Assessment of road traffic noise using mobile monitoring and statistical modelling**
Forum Acusticum, Torino, Italy

2022 **Validation of Nordic and European road traffic noise standards along a major highway**
Baltic-Nordic Acoustic Meeting, Aalborg, Denmark

2021 **A dynamic activity-based modelling approach to estimate air pollution exposure**
HARMO 20, Tartu, Estonia (online)

Posters

2021 **Predicting street-scale NO_2 and $PM_{2.5}$ concentrations using machine learning**
ITM 2021, Barcelona, Spain

2019 **From pixel to pollution: estimating daily $PM_{2.5}$ using MAIAC AOD, a case study of Copenhagen**
Nordic Remote Sensing Conference, Aarhus, Denmark

Teaching

2024–present **Course responsible and instructor, Advanced GIS in Health Sciences (5 ECTS, PhD level)**
Aarhus University
Spatial modelling of environmental pollution, GIS programming, spatial databases, interpolation, spatial autocorrelation and visualisation with R, Python, QGIS, ArcGIS and spatial SQL.

2024–present **Lecturer, Environmental Modelling Summer and Winter School**
University of Eastern Finland
Air quality modelling, environmental measurements, data analysis and spatial modelling for graduate and doctoral students.

2019–present **Lecturer and course organiser in environmental modelling, acoustics, data science and programming**
Aarhus University, across several departments
Air quality modelling, urban acoustics and road traffic noise, data science with Python and R, satellite data analysis, GIS, AI-assisted scientific programming and scientific writing.

2023–2025 **Guest lecturer**
Technical University of Denmark and University of Copenhagen
Atmospheric transport, dispersion and transformation in Global and Regional Air Pollution and Urban Air Pollution (DTU), and environmental noise, exposure assessment and health (KU).

2011–2015 **Lecturer in physics and engineering physics**
Dawood University of Engineering and Technology and Pakistan Air Force Degree College, Karachi
Undergraduate and graduate courses in physics, engineering mechanics, electronics, thermodynamics and quantum mechanics, including laboratory teaching.

Supervision

2025–present **PhD co-supervisor**
Phuong Le, University of Eastern Finland (with Professor Mikko Kolehmainen)
From LiDAR point cloud to solar-ready roof models: roof structure extraction, segmentation and post-processing

2026 **Main supervisor, MSc thesis**
Magnus Gasseholm Bæk and Gustav Gjessing Bruun, Department of Civil and Architectural Engineering, Aarhus University
A geometry-aware ANN surrogate model framework for predicting wind pressure coefficients on buildings of varying complexity

2025 **Main and external supervisor, MSc thesis**
Polyvios Gereoudakis, Department of Environmental and Resource Engineering, Technical University of Denmark
Ultrafine particle pollution in airport environments: employee and passenger exposure and effects on urban air quality

2024 **Main and external supervisor, MSc thesis**
Jeremy Wilson, Department of Environmental and Resource Engineering, Technical University of Denmark
Exploring the relationship between street-level air pollution and land cover types in Copenhagen: a machine learning approach

2018–present **Supervisor, co-supervisor and examiner**
Several MSc and BSc theses at Aarhus University, AU Health, Technical University of Denmark and University of Eastern Finland
Air pollution emissions and health, GIS and remote sensing, street-scale air pollution, land-use analysis and web GIS

Advisory and commissioned work

- **Danish National Monitoring Programme for Water and Nature (NOVANA).** National assessment and modelling of air pollution, reported to the Danish Ministry of Environment and the European Union. Ongoing.
- **Real-time air pollution information and forecasting system, Municipality of Copenhagen.** Scientific and technical support for an operational forecasting system supporting municipal decisions and public health measures.
- **Review of the Danish Road Directorate's ENVI model (environmental external effects).** Expert review of the national noise modelling used to estimate traffic-related noise and external costs.
- **Air pollution maps for Danish state roads with OML-Highway, Danish Road Directorate.** National mapping of air pollution along state roads, including re-implementation and optimisation of OML-Highway components in R.

Service

Committees and working groups

- Member, Task Force on Integrated Assessment Modelling (TFIAM), UNECE Convention on Long-range Transboundary Air Pollution, since 2024
- Member, FAIRMODE EU Working Group 6, Low-cost Sensors and Data Fusion for Air Quality, since 2023
- Institutional contact point for EURAMET, the European Association of National Metrology Institutes
- Institutional contact point for environmental noise research, Department of Environmental Science, Aarhus University

Assessment and editorial work

- Member of the PhD assessment committee for Siddharth Venkataraman, KTH Royal Institute of Technology, Sweden, 2025
- Guest editor, MDPI Atmosphere special issue "Air Quality and Sustainable Development Goals (SDGs)"
- Reviewer for international journals in air quality, noise, environmental modelling and exposure science

Professional societies

- Founding Chair, Danish Young Acousticians Network (DYAN), Danish Acoustical Society
- Member, Environmental Acoustics Technical Committee, Danish Acoustical Society

Departmental service and leadership

- Former member, Research Committee and Institute Forum, Department of Environmental Science, Aarhus University
- Coordination of several air pollution exposure projects at Aarhus University, 2016–2021
- Organiser and course lead, "Modelling of Air Pollution for Users of Modelled Data in Health Studies", Aarhus University, 2019

Outreach

- Invited public lecturer, Aarhus University GIS Day, Moesgaard Museum, 2023
- Organiser of national and international scientific conferences and expert meetings in Denmark and Pakistan

Research visits

2023 **Department of Global Health and Social Medicine, King's College London, United Kingdom**
Climate change and health research with a focus on older populations (host Professor Matthew Prina).

2023 **Department of Environmental and Biological Sciences, University of Eastern Finland**
Air quality modelling capabilities and national monitoring infrastructure (host Professor Mikko Kolehmainen).

2022 **Environmental Informatics Research Group, Aristotle University of Thessaloniki, Greece**
Machine learning, satellite data, data fusion and low-cost sensor networks for air quality (host Professor Kostas Karatzas).

2019 **Global Centre for Clean Air Research, University of Surrey, United Kingdom**
High-resolution air pollution modelling and low-cost sensors (host Professor Prashant Kumar).

Awards

2025	**Google Research Scholar Award** Competitive international award to early-career faculty, for physics-informed prediction of ultrafine particles.
2022	**Circle U Early-Career Researcher Mobility Grant** Competitive award across the Circle U European university alliance, for a research visit to King's College London.
2021	**MDPI Atmosphere Travel Award** For participation in ITM 2021, Barcelona.

Skills and languages

- **Programming and computing.** Python, R, SQL, MATLAB, Fortran. NumPy, SciPy, pandas, scikit-learn, PyTorch, TensorFlow, Keras. REST APIs, PostgREST, Nginx
- **Modelling software.** AirGIS, OSPM, OML-Highway, SoundPLAN. OpenFOAM and STAR-CCM+ (in progress)
- **Geospatial and remote sensing.** QGIS, ArcGIS, PostgreSQL/PostGIS, Google Earth Engine. Sentinel-5P TROPOMI, MAIAC AOD, Copernicus CAMS
- **Reproducible workflows.** Git, GitHub, GitHub Actions, SVN. Open-source scientific software at national scale
- **Languages.** English (fluent), Danish (intermediate, used professionally), Urdu (native)