DANIEL J. VARON

Curriculum Vitae | 20 October 2021
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EDUCATION

Ph.D., Atmospheric Chemistry, Harvard University 2015 – 2020
M.Sc., Applied Mathematics
Secondary field in Computational Science & Engineering
Faculty mentor: Daniel Jacob

B.A., English Literature, McGill University 2010 – 2014
First Class Honours
Faculty mentor: David Hensley

B.Sc., Physics, McGill University 2009 – 2014
First Class Honours
Faculty mentors: Shaun Lovejoy, Tracy Webb

PROFESSIONAL EXPERIENCE

Visiting Postdoctoral Research Associate, Princeton University 2021 –
Faculty host: Denise Mauzerall
School of Public and International Affairs

Postdoctoral Research Fellow, Harvard University 2020 –
Faculty mentor: Daniel Jacob
Co-appointed with GHGSat, Inc.

PUBLICATIONS (*SUBMITTED, *IN PREPARATION)

h-index = 9, total citations = 345 (as of October 20, 2021 on Google scholar)

*16. **Varon, D. J.**, D. J. Jacob, M. Sulprizio, L. Shen, H. Nesser, Z. Qu, X. Lu, C. A. Randles, A. Tewari, J. S. Brandman: An open-access, cloud-based facility for inferring high-resolution methane emissions from inversion of TROPOMI satellite observations, *in prep.*

*15. **Varon, D. J.**, D. J. Jacob, M. Sulprizio, L. Shen, H. Nesser, Z. Qu, X. Lu, M. Omara, D. Lyon, B. Hmiel, A. Lorente, J. D. Maasakkers, I. Aben: Continuous weekly monitoring of methane emissions from the Permian Basin by inversion of TROPOMI satellite observations, *in prep.*

*14. Shen, L., R. Gautam, M. Omara, D. Zavala-Araiza, J. D. Maasakkers, T. Scarpelli, A. Lorente, D. Lyon, J. Sheng, **D. J. Varon**, H. Nesser, Z. Qu, X. Lu, M. P. Sulprizio, S. Hamburg, D. J. Jacob: Satellite-based quantification of methane emissions from oil and natural gas basins in the United States and Canada, *submitted.*

*13. Sànchez-García, E., J. Gorroño, I. Irakulis-Loitxate, **D. J. Varon**, and L. Guanter: Mapping methane plumes at very high spatial resolution with the WorldView-3 satellite, *Atmos. Meas. Tech. Discuss.*, doi:10.5194/amt-2021-238, 2021.

12. Guanter, L., I. Irakulis-Loitxate, J. Gorroño, E. Sánchez-García, D. H. Cusworth, **D. J. Varon**, S. Cogliati, and R. Colombo: Mapping methane point emissions with the PRISMA spaceborne imaging spectrometer, *Rem. Sens. Env.*, doi:10.1016/j.rse.2021.112671, 2021.

11. Irakulis, I., L. Guanter, Y. Liu, **D. J. Varon**, J. D. Maasakkers, Y. Zhang, A. K. Thorpe, R. M. Duren, C. Frankenberg, D. Lyon, D. H. Cusworth, Y. Zhang, K. Seg, J. Gorroño, E. Sánchez-Garcia, M. P. Sulprizio, K. Cao, H. Zhu, J. Liang, X. Li, I. Aben, and D. J. Jacob: Satellite-based Survey of Extreme Methane Emissions in the Permian Basin, *Sci. Adv.*, doi:10.1126/sciadv.abf4507, 2021.

10. **Varon, D. J.**, D. Jervis, J. McKeever, I. Spence, D. Gains, and D. J. Jacob: High-frequency monitoring of anomalous methane point sources with multispectral Sentinel-2 satellite observations. *Atmos. Meas. Tech.*, doi:10.5194/amt-14-2771-2021, 2021.

9. Lyon, D. R., B. Hmiel, R. Gautam, M. Omara, K. Roberts, Z. R. Barkley, K. J. David, N. L. Miles, V. C. Monteiro, S. J. Richardson, S. Conley, M. L. Smith, D. J. Jacob, L. Shen, **D. J. Varon**, A. Deng, X. Rudelis, N. Sharma, K. T. Story, A. R. Brandt, M. Kang, E. A. Kort, A. J. Marchese, and S. P. Hamburg: Concurrent variation in oil and gas methane emissions and oil price during the COVID-19 pandemic. *Atmos. Chem. Phys.*, doi:10.5194/acp-21-6605-2021, 2021.

8. Jervis, D., J. McKeever, B. O. A. Durak, J. J. Sloan, D. Gains, **D. J. Varon**, A. Ramier, M. Strupler, and E. Tarrant: The GHGSat-D Imaging Spectrometer. *Atmos. Meas. Tech. Discuss.*, doi:10.5194/amt-2020-301, 2021.

7. Cusworth, D. H., R. M. Duren, A. K. Thorpe, S. Pandey, J. D. Maasakkers, I. Aben, D. Jervis, **D. J. Varon**, D. J. Jacob, C. A. Randles, M. Smith, R. Gautam, M. Omara, G. Schade, P. E. Dennison, C. Frankenberg, D. Gordon, E. Lopinto, and C. E. Miller: Multi-satellite imaging of a gas well blowout enables quantification of total methane emissions. *Geophys. Res. Lett.*, doi:10.1029/2020GL090864, 2020.

6. **Varon, D. J.**, D. J. Jacob, J. McKeever, and D. Jervis: Quantifying time-averaged methane emissions from individual coal mine vents with GHGSat-D satellite observations. *Environ. Sci. Tech.*, doi:10.1021/acs.est.0c01213, 2020.

5. Zhang, Y., R. Gautam, S. Pandey, M. Omara, J. D. Maasakkers, P. Sadavarte, D. Lyon, H. Nesser, M. P. Sulprizio, **D. J. Varon**, R. Zhang, D. Houweling, D. Zavala-Araiza, R. A. Alvarez, A. Lorente, S. P. Hamburg, I. Aben, & D. J. Jacob: Quantifying methane emissions from the largest oil producing basin in the U.S. from space. *Science Advances*, doi:10.1126/sciadv.aaz5120, 2020.

4. Cusworth, D. H., D. J. Jacob, **D. J. Varon**, C. Chan Miller, X. Liu, K. Chance, A. K. Thorpe, R. M. Duren, C. E. Miller, D. R. Thompson, C. Frankenberg, L. Guanter, and C. A. Randles: Potential of next-generation imaging spectrometers to detect and quantify methane point sources from space. *Atmos. Meas. Tech.*, doi:10.5194/amt2019-202, 2019.

3. **Varon, D. J.**, J. McKeever, D. Jervis, J. D. Maasakkers, S. Pandey, S. Houweling, I. Aben, T. Scarpelli, and D. J. Jacob: Satellite discovery of anomalously large methane point sources from oil/gas production. *Geophys. Res. Lett.*, doi:10.1029/2019GL083798, 2019.

2. **Varon, D. J.**, D. J. Jacob, J. McKeever, D. Jervis, B. O. A. Durak, Y. Xia, Y. Huang: Quantifying methane point sources from fine-scale satellite observations of atmospheric methane plumes. *Atmos. Meas. Tech.*, doi:10.5194/amt-11-5673-2018, 2018.

1. Lovejoy, S., D. Schertzer, **D. J. Varon**: Do GCMs predict the climate... or macro-weather? *Earth System Dynamics* 4, 439-454. doi:10.5194/esd-4-439-2013, 2013.

PRESENTATIONS

Invited talks

2021 Quantifying individual methane point sources in oil and gas fields using high-resolution satellite observations. NASA Jet Propulsion Laboratory Carbon Club seminar, 8 July.

2021 Quantifying individual methane point sources in oil and gas fields using high-resolution satellite observations. University of Washington Department of Atmospheric Sciences seminar, 26 April.

2021 Quantifying individual methane point sources in oil and gas fields using high-resolution satellite observations. Stanford University Energy Resources Engineering (ERE) seminar series, 5 April.

2019 Satellite discovery of anomalously large methane point sources from oil/gas production. (U14C-10) American Geophysical Union Fall Meeting, San Francisco, CA, 9-13 December.

2019 Quantifying methane point sources with fine-scale satellite observations. SRON Netherlands Institute for Space Research, Utrecht, Netherlands, 24 May.

Conference presentations

2020 Satellite Discovery of Anomalously Large Methane Point Sources from Oil/Gas Production. MIT A+B Applied Energy Symposium, Cambridge, MA, 12-14 August.

2019 Quantifying methane emissions from individual point sources with the GHGSat-D satellite instrument. (A53F-03) American Geophysical Fall Meeting, San Francisco, CA, 9-13 December.

2019 Quantifying methane emissions from individual coal mine vents with GHGSat-D satellite observations. 15th International Workshop on Greenhouse Gas Measurements from Space, Sapporo, JP, 3-5 June.

2019 Quantifying methane emissions from individual coal mine vents with GHGSat-D satellite observations. Industrial Methane Measurements Conference, Rotterdam, NL, 22-23 May.

2018 Quantifying methane point sources from fine-scale (GHGSat) satellite observations of atmospheric methane plumes. 14th International Workshop on Greenhouse Gas Measurements from Space, Toronto, ON, 8-10 May.

2017 Quantifying methane point sources from fine-scale (GHGSat) satellite observations of atmospheric methane plumes. (A32D-07) American Geophysical Union Fall Meeting, New Orleans, LA, 11-15 December.

Selected poster presentations

2018 Quantifying methane emissions from individual coal mine vents with GHGSat-D satellite observations. (A43R-3443) American Geophysical Union Fall Meeting, Washington, DC, 10-14 December.

TEACHING EXPERIENCE

Teaching assistant

Atmospheric Chemistry, Harvard University 2017

- Overall teaching score of 4.7/5.0 based on student reviews
- Awarded Harvard Certificate of Distinction in Teaching
- Responsibilities included developing new class materials, leading class discussions, writing and grading all assignments, and meeting with students individually.

MENTORING

Undergraduate students

- Daniel Shen (Harvard), 2021–present. Improving Sentinel-2 methane retrievals.

AWARDS AND FELLOWSHIPS

Sigma Xi Honor Society	2019
AGU Outstanding Student Presentation Award	2018
Harvard University Certificate of Distinction in Teaching	2017
Stonington Graduate Fellowship of Environmental Science and Engineering	2015
McGill University Dean's Honour List	2014
Numerous B.Sc. research fellowships	2011 – 2013

SERVICE

Convener International Measurements of Methane Emissions from the Fossil Fuel Industries, (A015) AGU Fall Meeting 2020.

Reviewer *Atmospheric Chemistry and Physics*, *Atmospheric Measurement Techniques*, *Environmental Science & Technology*, *Remote Sensing of Environment*, *Geophysical Research Letters*, *Nature Scientific Reports*, *Science of the Total Environment*

NASA proposal review panel, 2021

Leader *Methane Subgroup*, Harvard Atmospheric Chemistry Modeling Group (ACMG)

Machine Learning & Data Science Subgroup, Harvard ACMG

Member American Geophysical Union

Diversity, Inclusion, and Belonging Subgroup, Harvard ACMG

Organizer *Building an inclusive community in EPS/ESE: Addressing gender-based discrimination and harassment.* Department-wide event, February 2018.

2020 #ShutdownSTEM meeting, Harvard ACMG

Volunteer AstroMcGill astronomy outreach program, 2014