

DANIEL J. VARON

Curriculum Vitae | 16 May 2021

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29 Oxford Street | Cambridge, Massachusetts 02138

RESEARCH EXPERIENCE

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| 2020– | Postdoctoral Research Fellow
<i>Faculty mentor: Daniel Jacob</i>
Project: Quantifying methane emissions from oil/gas basins with satellite observations | Harvard University |
| 2020– | Postdoctoral Research Fellow
<i>Analytics team</i>
Graduate student intern researcher from 2016–2019
Project: Quantifying methane point sources with high-resolution satellite observations | GHGSat Inc. |

EDUCATION

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|------|--|--------------------|
| 2020 | PhD in Environmental Science and Engineering
Secondary field in Computational Science and Engineering
<i>Faculty mentor: Daniel Jacob</i> | Harvard University |
| 2018 | MSc in Applied Mathematics
<i>Faculty mentor: Daniel Jacob</i> | Harvard University |
| 2014 | BSc in Physics
First Class Honours
<i>Faculty mentors: Shaun Lovejoy, Tracy Webb</i> | McGill University |
| 2014 | BA in English Literature
First Class Honours
<i>Faculty mentor: David Hensley</i> | McGill University |

PUBLICATIONS

Manuscripts under review

1. 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. Gorrone, E. Sanchez-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.*, accepted 2021.

Selected Publications

2. **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](https://doi.org/10.5194/amt-14-2771-2021), 2021.
3. **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](https://doi.org/10.1021/acs.est.0c01213), 2020.
4. **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](https://doi.org/10.1029/2019GL083798), 2019.

5. **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](https://doi.org/10.5194/amt-11-5673-2018), 2018.

Additional published research

6. 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](https://doi.org/10.5194/acp-21-6605-2021), 2021.
7. 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](https://doi.org/10.5194/amt-2020-301), 2021.
8. 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](https://doi.org/10.1029/2020GL090864), 2020.
9. 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](https://doi.org/10.1126/sciadv.aaz5120), 2020.
10. 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](https://doi.org/10.5194/amt2019-202), 2019.
11. 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](https://doi.org/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. 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

Responsibilities included developing new class materials, leading class discussions, writing and grading all assignments, and meeting with students individually.

- 2017 *Atmospheric Chemistry* Harvard University
 Overall teaching score of 4.7/5.0 based on student reviews
 Awarded Harvard Certificate of Distinction in Teaching

HONORS & AWARDS

- 2019 Member of the Sigma Xi Honor Society
- 2018 AGU Outstanding Student Presentation Award
- 2017 Harvard University Certificate of Distinction in Teaching
- 2015 Stonington Graduate Fellowship of Environmental Science and Engineering
- 2014 McGill University Dean's Honour List

SERVICE

- Convener** International Measurements of Methane Emissions from the Fossil Fuel Industries, ([A015](#)) AGU Fall Meeting 2020.
- Reviewer** Atmospheric Measurement Techniques, Environmental Science & Technology, Remote Sensing of Environment
- Member** American Geophysical Union
- Organizer** Building an inclusive community in EPS/ESE: Addressing gender-based discrimination and harassment. Department-wide event, February 2018.

SELECTED PRESS

The Economist	Using satellites to spot industry's methane leaks
New York Times	A methane leak, seen from space, proves to be far larger than thought
Forbes	Detection of methane leak from space could herald a revolution
Bloomberg	Satellite studying volcanoes finds giant oilfield methane plume