

# DANIEL J. VARON

Curriculum Vitae | 12 August 2021

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## EXPERIENCE

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2020–	<b>Postdoctoral Research Fellow</b> <i>Faculty mentor: Daniel Jacob</i>	Harvard University
2020–	<b>Postdoctoral Research Fellow</b> <i>Analytics team</i>	GHGSat Inc.

## EDUCATION

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

## PUBLICATIONS

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### Manuscripts under review

1. Snchez-Garca, 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.*, submitted, 2021.
2. Guanter, L., I. Irakulis-Loitxate, J. Gorroño, E. Sánchez-Garca, D. H. Cusworth, **D. J. Varon**, and S. Cogliati, R. Colombo: Mapping methane point emissions with the PRISMA spaceborne imaging spectrometer, *Rem. Sens. Env.*, submitted, 2021.

### Selected publications

3. **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.
4. **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.
5. **Varon, D. J.**, J. McKeever, D. Jervis, J. D. Maasackers, 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.

6. **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

7. 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-García, 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](https://doi.org/10.1126/sciadv.abf4507), 2021.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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

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| 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

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### Teaching assistant

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

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| 2017 | <i>Atmospheric Chemistry</i>                               | Harvard University |
|      | Overall teaching score of 4.7/5.0 based on student reviews |                    |
|      | Awarded Harvard Certificate of Distinction in Teaching     |                    |

## HONORS & AWARDS

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| 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

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

<b>Reviewer</b>	<i>Atmospheric Measurement Techniques, Environmental Science &amp; Technology, Remote Sensing of Environment, Geophysical Research Letters</i>
<b>Member</b>	American Geophysical Union
<b>Leader</b>	Machine Learning & Data Science subgroup. Subgroup of the Harvard Atmospheric Chemistry Modeling Group (ACMG)
<b>Organizer</b>	Building an inclusive community in EPS/ESE: Addressing gender-based discrimination and harassment. Department-wide event, February 2018.

## SELECTED PRESS

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