DANIEL J. VARON

Curriculum Vitae | 6 April 2021

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RESEARCH EXPERIENCE

2020–	**Postdoctoral Research Fellow**	Harvard University

Faculty mentor: Daniel Jacob
Project: Quantifying methane emissions from oil/gas basins with satellite observations

2020–	**Postdoctoral Research Fellow**	GHGSat Inc.

Analytics team
Graduate student intern researcher from 2016–2019
Project: Quantifying methane point sources with high-resolution satellite observations

EDUCATION

2020	**PhD in Environmental Science and Engineering**	Harvard University

Secondary field in Computational Science and Engineering
Faculty mentor: Daniel Jacob

2018	**MSc in Applied Mathematics**	Harvard University

Faculty mentor: Daniel Jacob

2014	**BSc in Physics**	McGill University

First Class Honours
Faculty mentors: Shaun Lovejoy, Tracy Webb

2014	**BA in English Literature**	McGill University

First Class Honours
Faculty mentor: David Hensley

PUBLICATIONS

Manuscripts under review

1. 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. Discuss.*, doi:10.5194/acp-2020-1175, accepted, 2021.

2. 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. Gorrono, 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.*, 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, 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, 2020.

5. **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.

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, 2018.

Additional published research

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, 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, 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, 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, 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, 2013.

PRESENTATIONS

Invited talks

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