

# GREGORY FLESCH

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## Work Experience

- Jet Propulsion Laboratory (1992-Present)
    - Software Cognizant Engineer for Tunable Laser Spectrometer (TLS) on SAM/MSL (2005-Present)
    - Data Analyst (SAM Science Team for TLS on MSL (2008-Present)
    - Telemetry Software and script testing for SHERLOC instrument (2018-Present)
    - Systems Engineer (Assistant) for TLS on MSL (2005-2008)
    - Software Engineer for 12 high altitude aircraft (ER2, WB-57) and balloon-borne instruments (ALIAS, ALIAS-II, JLH spectrometers) (1993-2005)
    - Data Analyst for high-altitude spectrometers (1998-2005)
    - NASA Principal Investigator (PIDDP 2011-2015)
    - NASA Co-Investigator (MIDP 2003)
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## Education

- University of Southern California
    - M.S. Computer Science (2001)
  - California State Polytechnic University, Pomona
    - B.S. Computer Science (1993, cum laude)
  - Selected for JPL Systems Engineering Advancement (SEA) Program
    - (1 year mentored program) 2008
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## Professional Skills

- Software and Systems Engineering for Instrument Control
    - Autonomous and adaptive instrument control for tunable laser absorption spectrometers
  - Instrument design, optimization, fabrication and troubleshooting
  - Software Engineering for Scientific Applications
    - Spectroscopic Simulation tools
    - Highly automated web-based data processing software tools for TLS/MSL spectral data processing
    - Data-Mining and Visualization applications
    - Data translation and integration for very large data sets
  - BrainBench certified for Linux/Network/Security Administration
  - Strong mathematics and signal processing background
  - Laser/Optics/Chemical laboratory operations and safety manager
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## Awards

- NASA Exceptional Achievement Medal (2002, 2014)
  - 19 NASA Group Achievement Awards (1994-Present)
  - NASA Award for Technical Excellence (2001)
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## Publications

- Webster, Christopher R., Paul R. Mahaffy, Sushil K. Atreya, John E. Moores, Gregory J. Flesch, Charles Malespin, Christopher P. McKay et al. "Background levels of methane in Mars' atmosphere show strong seasonal variations." *Science* 360, no. 6393 (2018): 1093-1096.
- "A System-On-Chip platform for Earth and Planetary Laser Spectrometers", Flesch, Gregory, Didier Keymeulen, David Dolman, Chris Holyoake, and Derek McKee. In *Aerospace Conference, 2017 IEEE*, pp. 1-12. IEEE, 2017.
- "Five Years of Analyses of Volatiles, Isotopes and Organics in Gale Crater Materials", (co-author) In *AGU 2017 Fall Meeting*. 2017.
- "The imprint of atmospheric evolution in the D/H of Hesperian clay minerals on Mars", (co-author) *Science* 347, no. 6220 (2015): 412-414.
- "Mars methane detection and variability at Gale crater", Webster, Christopher R., Paul R. Mahaffy, Sushil K. Atreya, Gregory J. Flesch, Michael A. Mischna, Pierre-Yves Meslin, Kenneth A. Farley et al. *Science* 347, no. 6220 (2015): 415-417.
- "Non-detection of methane in the Mars atmosphere by the curiosity rover", Webster, Chris R., Paul R. Mahaffy, Sushil K. Atreya, Gregory J. Flesch, and Kenneth A. Farley. (2014).
- "Isotope ratios of H, C, and O in CO<sub>2</sub> and H<sub>2</sub>O of the martian atmosphere", Webster, C. R., Mahaffy, P. R., Flesch, G. J., Niles, P. B., Jones, J. H., Leshin, L. A., ... & Steele, A., *Science*, 341(6143), 260-263 (2013).
- "Low Upper Limit to Methane Abundance on Mars", Webster, C. R., Mahaffy, P. R., Atreya, S. K., Flesch, G. J., & Farley, K. A. *Science*, 1242902 (2013).
- "Volatile, Isotope, and Organic Analysis of Martian Fines with the Mars Curiosity rover." (co-author) *Science*, 341(6153), 1238937 (2013).
- "The Sample Analysis at Mars Investigation and instrument suite" (co-author) *Space Science Review* (2012)
- "Adaptive Tunable Laser Spectrometers" G. Flesch and D. Keymeulen, 2010 IEEE aerospace, Big Sky, MT, March 2010.
- "Adaptive Tunable Laser Spectrometers" G. Flesch and D. Keymeulen, 2010 *IEEE aerospace*, Big Sky, MT, (March 2010).
- "Tunable Laser Paleothermometer for Determining Climate Change" C.R. Webster, F. Carsey, M. Hecht, and G.J. Flesch, *Applied Optics*, (2003).
- "Airborne Laser Isotope Spectrometer (ALIS) for Measuring Terrestrial 13C/12C and 18O/16O in Atmospheric Carbon Dioxide", C.R. Webster, L. Christensen, and G.J. Flesch, *Applied Optics*, (2003).
- "Mars Laser Hygrometer, C.R. Webster, G.J. Flesch, R. Haberle, and J. Bauman, *Applied Optics*, 43, 4436-4445, (2004).

- "The Construction of a Unified, High-Resolution Nitrous Oxide Data Set for ER-2 Flights During SOLVE" (co-author) SOLVE/THESEO special issue *J. Geophys. Res.* (2001).
- "Quantum cascade laser measurements of stratospheric methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O)" (co-author) *Applied Optics*, 38, 4609-4622, (1998).
- "Airborne Laser Infrared Absorption Spectrometer (ALIAS-II) for In situ Atmospheric Measurements of N<sub>2</sub>O, CH<sub>4</sub>, CO, HC<sub>1</sub>, and NO<sub>2</sub> from Balloon or RPA Platforms" (co-author) *Applied Optics*, (December 1999).
- "Evolution of HC<sub>1</sub> Concentrations in the Lower Stratosphere from 1991 to 1996 Following the Eruption of Mt. Pinatubo" (co-author) *Geophysical Research Lett.* 25, 995-998, (1998).