

Dr. Jacob C. Laas  
XXXXXXXXXX XX  
8oXXX München, DE



Citizenship: USA  
Birthdate: X-XXX-198X  
Marital status: Single  
Tel.: +49 151-XXXXXXXX  
Email: [jclaas@gmail.com](mailto:jclaas@gmail.com)  
Website: <https://laasworld.de/>

## Education

- 2008 – 2014 Ph.D., Physical Chemistry, Emory University (Atlanta, USA)  
Thesis: “Methanol Photodissociation as a Case Study for Probing Complex Interstellar Organic Chemistry”
- 2004 – 2008 B.S., Chemistry, Pittsburg State University (Pittsburg, Kansas, USA)  
*Graduated with Departmental Academic Honors*
- 2000 – 2004 Southeast High School (Cherokee, Kansas, USA)  
*Graduated with Honors*

## Work/Research Experience

- 2014 – Present *Post-doctoral Researcher*, Max-Planck-Institut für extraterrestrische Physik, Garching, DE.
- Experimental physics laboratory design/setup in small team of scientists/engineers.
  - Equipment procurement, supplier management.
  - Chemical modeling.
  - Computer interfacing for instrumentation control and data visualization/analysis.
  - Computer administration (ca. 4 Linux workstations/servers).
  - Data management and web front-end design.
- 2008 – 2014 *Graduate Research Assistant*, Emory University, Atlanta, USA.
- Experimental physics laboratory design/setup for molecular spectroscopy.
  - Full operation of astronomical observatory (8 weeks on-site, ca. 1 week remote).
  - Chemical modeling.
  - Computer interfacing for instrumentation control and data visualization/analysis.
  - Basic mechanical workshop operation and basic electronics for repair/troubleshooting.
  - Lab manager as teaching assistant (ca. 1 year).

- 2004 – 2008     *Undergraduate Research Assistant, Pittsburg State University, Pittsburg, Kansas, USA.*
- Chemical synthesis of fluorescent and phosphorescent dendrimers for organic light-emitting diodes.
  - Design, synthesis and characterization of dozens of small organic molecules for testing as novel anti-fungal agents.
  - Design and construction of a diskless HPC beowulf cluster for use with *ab initio* quantum chemical calculations.
  - Design and synthesis of a variety of benzyl ester polymers for studying the birefringent properties of liquid crystals.
  - Construction of a polarizing microscope from parts for optical characterization of liquid crystals.
- Summer 2007     *Undergraduate Research Assistant, IBM Almaden Research Center, San Jose, California, USA*
- Quantum chemical calculations to study catalysis reactions.
  - Software development (Java) to tailor an in-house molecular viewer.
- 2004 – 2006     *Computer Technician, Four State Computer, Pittsburg, Kansas, USA*
- Computer troubleshooting/repair.

## Refereed Publications

CN Shingledecker, T Lamberts, JC Laas, A Varyunin, E Herbst, J Kästner and P Caselli, "On sulfur-bearing species in interstellar ices: The effects of cosmic ray-driven radiation chemistry and non-diffusive bulk reactions," *Astropys. J.*, **2019**, *accepted*.

J Laas and P Caselli, "Modeling Sulfur Depletion in Interstellar Clouds," *Astro. & Astrophys.*, **2019**, *624*, A108, DOI:10.1051/0004-6361/201834446.

J Chantzios, S Spezzano, C Endres, L Bizzocchi, V Lattanzi, J Laas, A Vasyunin and P Caselli, "Rotational spectroscopy of the HCCO and DCCO radicals in the millimeter and submillimeter range," *Astro. & Astrophys.*, **2019**, *621*, A111, DOI:10.1051/0004-6361/201834419.

V Lattanzi, S Spezzano, JC Laas, J Chantzios, L Bizzocchi, KLK Lee, MC McCarthy and Paola Caselli, "HSCO<sup>+</sup> and DSCO<sup>+</sup>: a multi-technique approach in the laboratory for the spectroscopy of interstellar ions," *Astro. & Astrophys.*, **2018**, *620*, A184, DOI:10.1051/0004-6361/201834340.

L Bizzocchi, M Melosso, L Dore, CD Esposti, F Tamassia, D Prudenzano, V Lattanzi, J Laas, S Spezzano, BM Giuliano, CP Endres and P Caselli, "Accurate Laboratory Measurement of the Complete Fine Structure of the N = 1 $\Lambda$ -0 Transition of <sup>15</sup>NH," *Astrophys. J.*, **2018**, *863*, 3 (7pp), DOI:10.3847/1538-4357/aacffc.

D Prudenzano, J Laas, L Bizzocchi, V Lattanzi, C Endres, BM Giuliano, S Spezzano, ME Palumbo and P Caselli, "Accurate millimetre and submillimetre rest frequencies for cis- and trans-dithioformic acid, HCSSH," *Astro. & Astrophys.*, **2018**, *612*, A56, DOI:10.1051/0004-6361/201732397.

A Punanova, P Caselli, S Feng, A Chacón-Tanarro, C Ceccarelli, R Neri, F Fontani, I Jiménez-Serra, C Vastel, L Bizzocchi, A Pon, AI Vasyunin, S Spezzano, P Hily-Blant, L Testi, S Viti, S Yamamoto, F Alves, R Bachiller, N Balucani, E Bianchi, S Bottinelli, E Caux, R Choudhury, C Codella, F Dulieu, C Favre, J Holdship, AJ Al-Edhari, C Kahane, J Laas, B LeFloch, A López-Sepulcre, J Ospina-Zamudio, Y Oya, JE Pineda, L Podio, D Quenard, A Rimola, N Sakai, IR Sims, V Taquet, P Theulé and P Ugliengo, "Seeds of Life in Space (SOLIS). III. Zooming Into the Methanol Peak of the Prestellar Core L1544," *Astrophys. J.*, **2018**, *855*, 112, DOI:10.3847/1538-4357/aaad09.

C Ceccarelli, P Caselli, F Fontani, R Neri, A López-Sepulcre, C Codella, S Feng, I Jiménez-Serra, B Lefloch, JE Pineda, C Vastel, F Alves, R Bachiller, N Balucani, E Bianchi, L Bizzocchi, S Bottinelli, E Caux, A Chacón-Tanarro, R Choudhury, A Coutens, F Dulieu, C Favre, P Hily-Blant, J Holdship,

C Kahane, AJ Al-Edhari, J Laas, J Ospina, Y Oya, L Podio, A Pon, A Punanova, D Quenard, A Rimola, N Sakai, IR Sims, S Spezzano, V Taquet, L Testi, P Theulé, P Ugliengo, AI Vasyunin, S Viti, L Wiesenfeld and S Yamamoto, "Seeds Of Life In Space (SOLIS): The Organic Composition Diversity at 300–1000 au Scale in Solar-type Star-forming Regions," *Astrophys. J.*, **2017**, 850, 176, DOI: 10.3847/1538-4357/aa961d.

L Bizzocchi, F Tamassia, J Laas, BM Giuliano, CD Esposti, L Dore, M Melosso, E Canè, AP Charmet, HSP Müller, H Spahn, A Belloche, P Caselli, KM Menten and RT Garrod, "Rotational and High-resolution Infrared Spectrum of HC<sub>3</sub>N: Global Ro-vibrational Analysis and Improved Line Catalog for Astrophysical Observations," *Astrophys. J. Supp.*, **2017**, 233, 11, DOI: 10.3847/1538-4365/aa9571.

F Fontani, C Ceccarelli, C Favre, P Caselli, R Neri, IR Sims, C Kahane, FO Alves, N Balucani, E Bianchi, E Caux, AJ Al-Edhari, A López-Sepulcre, JE Pineda, R Bachiller, L Bizzocchi, S Bottinelli, A Chacón-Tanarro, R Choudhury, C Codella, A Coutens, F Dulieu, S Feng, A Rimola, P Hily-Blant, J Holdship, I Jiménez-Serra, J Laas, B Lefloch, Y Oya, L Podio, A Pon, A Punanova, D Quenard, N Sakai, S Spezzano, V Taquet, L Testi, P Theulé, P Ugliengo, C Vastel, AI Vasyunin, S Viti, S Yamamoto and L Wiesenfeld, "Seeds of Life in Space (SOLIS) - I. Carbon-chain growth in the Solar-type protocluster OMC2-FIR4," *Astro. & Astrophys.*, **2017**, 605, A57, DOI: 10.1051/0004-6361/201730527.

C Codella, C Ceccarelli, P Caselli, N Balucani, V Barone, F Fontani, B Lefloch, L Podio, S Viti, S Feng, R Bachiller, E Bianchi, F Dulieu, I Jiménez-Serra, J Holdship, R Neri, JE Pineda, A Pon, I Sims, S Spezzano, AI Vasyunin, F Alves, L Bizzocchi, S Bottinelli, E Caux, A Chacón-Tanarro, R Choudhury, A Coutens, C Favre, P Hily-Blant, C Kahane, AJ Al-Edhari, J Laas, A López-Sepulcre, J Ospina, Y Oya, A Punanova, C Puzzarini, D Quenard, A Rimola, N Sakai, D Skouteris, V Taquet, L Testi, P Theulé, P Ugliengo, C Vastel, F Vazart, L Wiesenfeld and S Yamamoto, "Seeds of Life in Space (SOLIS) - II. Formamide in protostellar shocks: Evidence for gas-phase formation," *Astro. & Astrophys.*, **2017**, 605, L3, DOI: 10.1051/0004-6361/201731249.

SL Widicus Weaver, JC Laas, L Zou, JA Kroll, ML Rad, BM Hays, JL Sanders, DC Lis, TN Cross, N Wehres, BA McGuire and MC Sumner, "Deep, Broadband Spectral Line Surveys of Molecule-rich Interstellar Clouds," *Astrophys. J. Supp. Series*, **2017**, 232 (1), 3, DOI: 10.3847/1538-4365/aa8098.

L Bizzocchi, V Lattanzi, J Laas, S Spezzano, BM Giuliano, D Prudenzano, C Endres, O Sipilä and P Caselli, "Accurate sub-millimetre rest frequencies for HOCO<sup>+</sup> and DOCO<sup>+</sup> ions," *Astro. & Astrophys.*, **2017**, 602, A34, DOI: 10.1051/0004-6361/201730638.

JC Laas and SL Widicus Weaver, "The Submillimeter Spectrum of the Methoxy Radical at Low Temperatures," *Astrophys. J.* **2017**, 835, 46, DOI: 10.3847/1538-4357/835/1/46.

BM Hays, N Wehres, B Alligood DePrince, AAM Roy, JC Laas and SL Widicus Weaver, "Rotational spectral studies of O(<sup>1</sup>D) insertion reactions with methane and ethylene: Methanol and vinyl alcohol in a supersonic expansion," *Chem. Phys. Lett*, **2015**, 630, 18–26, DOI: 10.1016/j.cplett.2015.04.011.

C Walsh, TJ Millar, H Nomura, E Herbst, S Widicus Weaver, Y Aikawa, JC Laas and AI Vasyunin, "Complex organic molecules in protoplanetary disks," *Astron. Astrophys.*, **2014**, 563, A33, DOI: 10.1051/0004-6361/201424911.

JC Laas, BM Hays and SL Widicus Weaver, "Multipass Millimeter/Submillimeter Spectrometer to Probe Dissociative Reaction Dynamics," *J. Phys. Chem. A*, **2013**, 117 (39), 9548–9554, DOI: 10.1021/jp3122402.

JC Laas, RT Garrod, E Herbst and SL Widicus Weaver, "Contributions from grain surface and gas phase chemistry to the formation of methyl formate and its structural isomers," *Astrophys. J.*, **2011**, 728 (71), 9pp, DOI: 10.1088/0004-637X/728/1/71.

## Skills and Qualifications

Analytical thinking

System design/engineering

Molecular spectroscopy and characterization (UV/Vis, IR, Raman, microwave/mm/submm, NMR, GC/MS)

*Ab initio* quantum chemistry (Psi4, GAMESS US, Gaussian)

Single-dish observational radio astronomy

Synthetic organic chemistry

Optics: amateur astronomy, hobbyist microscopy, quasioptical mm-/submm-wave beams, laser alignment/re-tuning

Workshop tools/machining: mill, lathe, band saw, handheld rotary tools

Vacuum technology (high vacuum)

Basic analog circuit design/repair and electronic interfaces

Computer-aided design/visualization/analysis: FreeCAD, Solidworks, SYNOPSYS, ImageJ, The GIMP

Document production:  $\text{\LaTeX}$ , Microsoft Office, LibreOffice

Data analysis/visualization: Gnuplot, real-time plotting via PyQtGraph, computer algebra systems (Maple, Sage, MATLAB, GNU Octave)

Programming languages: Python, Unix shell, Perl, HTML (v4/v5, PHP, CSS, JS), Java (PC, Android, Beanshell), NI LabWindows/CVI (ANSI C) C++ , Fortran (1977, 2003)

Operating systems: Linux (Debian/Ubuntu), Microsoft Windows, Android, macOS

Advanced computer administration/repair

Other computing systems: user interfaces (Qt, Tk), instrumentation interfaces (device drivers, communication socket/APIs), open-source software (incl. git versioning control)

Outdoor camping (12 years in Boy Scouts of America)

Languages spoken: English (native), German (A1 certified, ca. B1/B2 uncertified)

## Interests

Computing

Instrumentation/interfaces

Data Visualization

Travel

Music (piano)

Disc sports: disc golf, ultimate

Backyard astronomy

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