

Pin Chen  
Jet Propulsion Laboratory, California Institute of Technology  
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#### EDUCATION

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***California Institute of Technology, Pasadena, CA, USA***

**Ph.D. in Chemistry** (chemical physics)

**June, 1999**

Dissertation: "Terahertz Generation via Optical-Heterodyne Conversion: Development of a New Far-Infrared Spectrometer and Its Applications toward a Better Understanding of Nonrigid, Astronomically Important Molecules."

***University of California, Berkeley, CA, USA***

**B.S. in Chemistry**

**December, 1991**

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#### SELECTED AWARDS & HONORS

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- JPL Discovery Award "for being the lead for Exoplanets informal meetings that were valuable to formulating the Exoplanets strategic initiative at the Jet Propulsion Laboratory" **2015**
- JPL Team Award "for outstanding contributions to the Deep Space Atomic Clock (DSAC) Environmental Test Team" **2015**
- JPL Team Award "for outstanding contributions to the Deep Space Atomic Clock (DSAC) Flight Clock First Light Team" **2015**
- JPL Team Award "for outstanding contributions to the Deep Space Atomic Clock (DSAC) Ion Trap Tube Team" **2015**
- JPL Team Bonus Award "for outstanding contributions to the Deep Space Atomic Clock (DSAC) Project Preliminary Design Review (PDR) Team" **2013**
- NASA Certificate of Appreciation in recognition of "valuable contribution and outstanding support to the Advanced Component Technologies (ACT) program and the NASA Earth Science Technology Office" **2009**
- JPL Team Bonus Award for the "successful balloon flight of the Planetscope Precursor Experiment" **2008**
- NASA Group Achievement Award for the "Molecular Spectroscopy Team" **2006**
- NASA Group Achievement Award for the "Aura Microwave Limb Sounder Instrument Team" **2005**
- NASA Group Achievement Award for the "Balloon Observations of the Stratosphere Team" **2004**
- NASA New Investigator in Earth Science **2002 – 2005**
- National Research Council's Postdoctoral Research Associateship **1999 – 2000**
- NASA New Technology Report Award for "Tunable Terahertz Source Using Near Infrared Diode Lasers" **1999**

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EXPERIENCE

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| <b><u>Jet Propulsion Laboratory</u></b> , <i>California Institute of Technology, Pasadena, CA, USA</i><br><b>Research Scientist</b> (Planetary Science Section)                  | <b>2006 – Present</b>               |
| <b><u>Jet Propulsion Laboratory</u></b> , <i>California Institute of Technology, Pasadena, CA, USA</i><br><b>Cognizant Engineer, Deep Space Atomic Clock Project</b>             | <b>2013 - 2015</b>                  |
| <b><u>California Institute of Technology</u></b> , <i>Pasadena, CA, USA</i><br><b>Visiting Associate</b> (Division of Chemistry & Chemical Engineering)                          | <b>2007 – 2013</b>                  |
| <b><u>Jet Propulsion Laboratory</u></b> , <i>California Institute of Technology, Pasadena, CA, USA</i><br><b>Group Supervisor, Acting</b> (Atmospheric Laser Spectroscopy Group) | <b>12/2006 – 2/2007</b>             |
| <b><u>Jet Propulsion Laboratory</u></b> , <i>California Institute of Technology, Pasadena, CA, USA</i><br><b>Scientist</b> (Earth Science Section, Planetary Science Section)    | <b>2000 – 2006</b>                  |
| <b><u>National Institute of Standards &amp; Technology (NIST)</u></b> , <i>Boulder, CA, USA</i><br><b>Research Chemist</b> (post-doctoral, Time and Frequency Division)          | <b>1999 – 2000</b>                  |
| <b><u>California Institute of Technology</u></b> , <i>Pasadena, CA, USA</i><br><b>Graduate Research Assistant</b>  | <b>1992 – 1999</b>                  |
| <b><u>Air Instruments &amp; Measurements</u></b> , <i>LLC, Baldwin Park, CA, USA</i><br><b>Consultant</b>  | <b>1997 – 1998</b>                  |
| <b><u>Lawrence Berkeley Laboratory (LBL)</u></b> , <i>Berkeley, CA, USA</i><br><b>Undergraduate Research Assistant, Research Associate (approximate title)</b>                   | <b>1990 – 1992,<br/>1988 – 1989</b> |

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PRINCIPAL-INVESTIGATOR AWARDS

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| <i>JPL Research &amp; Technology Development (R&amp;TD): Special Exoplanet and Comparative Planetary Science Systems Initiative</i><br><b>"A New Framework for Detecting Exoplanet Habitability and Life"</b>                        | <b>2015</b>        |
| <i>JPL Advanced Concept Studies Program</i><br><b>"3-D Spectral-Imager for Venus Observations"</b>   | <b>2013</b>        |
| <i>JPL Research &amp; Technology Development Program (R&amp;TD)</i><br><b>"Chemistry &amp; Transport Modeling of Exoplanetary Atmospheres"</b>   | <b>2010 – 2011</b> |
| <i>NASA Planetary Instrument Definition &amp; Development Program (PIDDP)</i><br><b>"Massively Parallel, Cavity-Enhanced, Laser Spectroscopy (MCELS) for Planetary and Lunar Exploration"</b>  | <b>2009 – 2013</b> |
| <i>JPL Center for Exoplanet Science</i><br><b>"Seeing in the Stratosphere"</b>   | <b>2009</b>        |
| <i>NASA Mars Fundamental Research Program (MFRP)</i><br><b>"Kinetic-Isotope Effects of Key Photochemical Reactions on Mars"</b>  | <b>2007 – 2010</b> |
| <i>NASA Planetary Instrument Definition &amp; Development Program (PIDDP)</i><br><b>"A New <i>In-Situ</i> Measurement Technique for Stable-Isotope Analysis of Methane and Other Important Atmospheric/Volatile Species on Mars"</b> | <b>2005 – 2008</b> |
| <i>JPL Innovative Spontaneous Concepts (ISC)</i><br><b>"Proof of a Novel Concept for Measuring Optical Properties of Aerosols"</b>   | <b>2006</b>        |
| <i>JPL Research &amp; Technology Development Program (R&amp;TD)</i>  |                    |

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| <b>"A Promising New Near-Infrared Laser Technique for <i>In-Situ</i> Mars Exploration"</b>          | <b>2003 – 2005</b> |
| <i>NASA New Investigator Program in Earth Science (NIP)</i>   |                    |
| <b>"Tropospheric Monitoring of CO Isotopes by Cavity-Enhanced, Optical Heterodyne Spectroscopy"</b> | <b>2002 – 2005</b> |

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CO-INVESTIGATOR AWARDS

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| <i>NASA Solar System Workings</i>  |                    |
| <b>"Mars' Ancient Climate: Production and Evolution of a Reduced Greenhouse Atmosphere," PI: Dr. A. Jim Friedson (JPL)</b>   | <b>2015 – 2018</b> |
| <i>JPL President's &amp; Director's Fund</i>   |                    |
| <b>"Exoplanet Clouds and Hazes," Co-PIs: Dr. Mark Swain (JPL) &amp; Prof. Yuk Yung (Caltech)</b>   | <b>2015 – 2016</b> |
| <i>JPL President's &amp; Director's Fund</i>   |                    |
| <b>"NIR-Visible Astrocomb with Frequency Doubling for Broadband Spectrograph Calibration," Co-PIs: Dr. Chas Beichman (JPL) &amp; Prof. Kerry Vahala (Caltech)</b>            |                    |
| <i>JPL President's &amp; Director's Fund</i>   |                    |
| <b>"Micro-Astrocomb for Planet Finding Through Precision Radial Velocity Measurements", Co-PIs: Dr. Chas Beichman (JPL) &amp; Prof. Kerry Vahala (Caltech)</b>               | <b>2013 – 2015</b> |
| <i>JPL President's &amp; Director's Fund</i>   |                    |
| <b>"Next Generation Tunable Laser Spectrometer (TLS) - Maintaining JPL's Leadership Position", Co-PIs: Dr. Lance Christensen (JPL) &amp; Prof. Mitchio Okumura (Caltech)</b> | <b>2013 – 2015</b> |
| <i>JPL Innovative Spontaneous Concepts (ISC)</i>   |                    |
| <b>"Divergent Evolution of Earth's and Venus' Atmospheres," PI: Dr. A. Jim Friedson (JPL)</b>  | <b>2012</b>        |
| <i>NASA Experimental Program to Stimulate Competitive Research (EPSCoR)</i>  |                    |
| <b>"New Mexico Exoplanet Spectroscopic Survey Instrument (NESSI)," PI: Dr. Patricia Hynes (New Mexico State University)</b>  | <b>2009 – 2012</b> |
| <i>NASA Planetary Instrument Definition &amp; Development Program (PIDDP)</i>  |                    |
| <b>"Aquarius: An <i>In Situ</i> Water Isotope Analyzer for Exploring Planetary Ice," PI: Dr. Miles Smith (JPL)</b>   | <b>2008 – 2011</b> |
| <i>JPL Research &amp; Technology Development Program (R&amp;TD)</i>  |                    |
| <b>"Advanced InGaAs-based Single-Mode Semiconductor Lasers for Atmospheric Sensing and Lidar," PI: DR. Yueming Qiu (JPL)</b>   | <b>2002 – 2005</b> |
| <i>JPL Bio-Nano Technology Program</i>   |                    |
| <b>"Quantum Dot Lasers for NASA <i>In-Situ</i> Sensing Applications," Dr. Yueming Qiu (JPL)</b>  | <b>2002 – 2005</b> |

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INVITED LECTURES/SEMINARS

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| <i>AOGS (Asia Oceania Geosciences Society) 8<sup>th</sup> Annual Meeting, Taipei, Republic of China (Taiwan)</i> |                     |
| <b>"Massively Parallel, Cavity-Enhanced, Laser Spectroscopy (MCELS) for Planetary Exploration"</b>               | <b>August, 2011</b> |
| <i>Institute of Astronomy &amp; Astrophysics, Academia Sinica, Taipei, Republic of China (Taiwan)</i>            |                     |

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| <b>"Atmospheric Chemistry of Extrasolar Planets"</b>   | <b>August, 2011</b>   |
| <i>IGPP (Institute of Geophysics Planetary Physics) Seminar Series, University of California, Los Angeles, CA, USA</i>                       |                       |
| <b>"Atmospheric Chemistry of Extrasolar Planets"</b>   | <b>May, 2011</b>      |
| <i>Planetary Evolution &amp; Habitability course, California Institute of Technology, Pasadena, CA, USA</i>                                  |                       |
| <b>"Extrasolar Planets: Life, Habitability, Climate, &amp; Atmosphere"</b>   | <b>March, 2011</b>    |
| <i>Workshop on Innovative Approaches to Exoplanet Spectra, Keck Institute for Space Studies, California Institute of Technology, CA, USA</i> |                       |
| <b>"Balloon Environment"</b>   | <b>November, 2009</b> |
| <i>Planetary Evolution &amp; Habitability course, California Institute of Technology, Pasadena, CA, USA</i>                                  |                       |
| <b>"Atmospheric Laser Spectroscopy for <i>In-Situ</i> Habitability Detection"</b>  | <b>March, 2009</b>    |
| <i>The Center for Adaptive Optics Fall 2007 Retreat, Lake Arrowhead, CA, USA</i>   |                       |
| <b>"Stratospheric seeing &amp; contrast limits for a balloon-borne coronagraph"</b>  | <b>November, 2007</b> |
| <i>Yuk Yung Lunch Seminar Series, California Institute of Technology, CA, USA</i>  |                       |
| <b>"Noise-immune, cavity-enhanced spectroscopy and ultra-sensitive atmospheric measurements"</b>   | <b>February, 2006</b> |
| <i>"Enlightenment Lecture", Nippon Institute of Technology, Japan</i>  |                       |
| <b>"Optoelectronic terahertz sources based on photomixers"</b>   | <b>February, 2003</b> |

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TEACHING/MENTORING EXPERIENCE (some redundancy with "Invited Lectures/Seminars")

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*Chinese-American Oceanic & Atmospheric Association, Irvine, CA*

**Invited Speaker**

Spoke about career development and proposal writing in the session "Golden Keys to Success" to young researchers **2012**

*California Institute of Technology, Pasadena, CA, USA*

**Invited Lecturer**

Presented lecture on "Extrasolar Planets: Life, Habitability, Climate, & Atmosphere" to the "Planetary Evolution & Habitability" class in the Geological & Planetary Sciences Division **2011**

*California Institute of Technology, Pasadena, CA, USA*

**Invited Lecturer**

Presented lecture on "Atmospheric Laser Spectroscopy for In-Situ Habitability Detection" to the "Planetary Evolution & Habitability" class in the Geological & Planetary Sciences Division. **2009**

*Jet Propulsion Laboratory, California Institute of Technology, CA, USA*

**Post-Doctoral Research Mentor**

**2011 – present**

*California Institute of Technology, Pasadena, CA, USA*

**Graduate-Student Mentor/Ph.D. Thesis Committee Member**

**2003 – present**

Mentoring chemistry graduate students conducting research in spectroscopic instrumentation.

*Jet Propulsion Laboratory, California Institute of Technology, CA, USA*

**Undergraduate-Student Mentor**

**2007 – present**

Mentoring summer undergraduate students conducting research in spectroscopic instrumentation.

*Nippon Institute of Technology, Saitama Prefecture, Japan*

**Invited Lecturer**

**2003**

Presented four lectures to graduate students in the Department of Electrical and Electronics Engineering on advanced theories and techniques in the areas of collisional broadening of molecular lines, quantitative spectroscopic measurements, and terahertz technology. Directly advised graduate students on experimental design and data analysis techniques. Presented an "enlightenment lecture" to department faculty and general audience.

*California Institute of Technology, Pasadena, CA, USA*

**Teaching Assistant** – "Fundamental Techniques of Experimental Chemistry."

**1993**

Instructed and supervised students in introductory undergraduate laboratory chemistry course.

**Teaching Assistant** – "Chemical Equilibrium and Analysis Laboratory."

**1993**

Instructed and supervised students in conducting experiments designed to illustrate modern instrumental techniques that are currently employed in industrial and academic research. Emphasis was on determinations of chemical composition, measurement of equilibrium constants, evaluation of rates of chemical reactions, and trace-metal analysis.

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#### COMMUNITY ORGANIZATION & SERVICE

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*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Co-Lead, JPL Exoplanet Science Initiative**

**2016 – present**

*Keck Institute for Space Studies, California Institute of Technology, Pasadena, CA, USA*

**Co-Lead, "Methane on Mars" KISS Study Program**

**2015 – present**

*Keck Institute for Space Studies, California Institute of Technology, Pasadena, CA, USA*

**Core Member, "Optical Frequency Combs for Space Applications" KISS Study Program**

**2015 – present**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Member, Science Team, "The Exoplanet and Comparative Planetary Systems Science Initiative"**

**2014 – present**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Member, Hiring Committee: Scientist III & Scientist VI, Exoplanet and Comparative Planetary Systems Science Strategic Hires**

**2015**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Member, Hiring Committee: Postdoctoral Research in the Exoplanetary and Comparative Planetary Sciences at JPL/Caltech**

**2014 – 2015**

*NASA, Research Opportunities in Space and Earth Sciences (ROSES)*

**Panelist, Proposal Review Panel**

**2013**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Co-Author, "Fain Object Explorer," NASA Study on Applications of Large Space Optics (SALSO)**

**2013**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Organizer, "UCLA-JPL Planets Meeting" workshop**

**2013**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

**Organizer, "UCLA-JPL Planets/Exoplanets Day" workshop**

**2011**

*Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA*

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| <b>Member, hiring committee, staff scientist position in earth atmospheric science</b>  | <b>2010</b>           |
| <i>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA</i>   |                       |
| <b>Co-author, white paper on "Laboratory Spectroscopy to Support Remote Sensing of Atmospheric Composition," submitted to the National Academies Space Studies Board's Planetary Science Decadal Survey.</b>        | <b>2009</b>           |
| <i>Keck Institute for Space Studies, California Institute of Technology, Pasadena, CA, USA</i>  |                       |
| <b>Core member of study program: "Innovative Approaches to Exoplanet Spectra."</b>  | <b>2009</b>           |
| <i>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA</i>   |                       |
| <b>Co-author, "Planetscope: Exoplanet Characterization from a Balloon Platform," in response to the request for information from Astro2010: Astronomy and Astrophysics Decadal Survey Subcommittee on Programs.</b> | <b>2009</b>           |
| <i>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA</i>   |                       |
| <b>Co-signer, white paper on "Exoplanet Characterization and the Search for Life," submitted to <i>Astro2010: the Astronomy and Astrophysics Decadal Survey</i>.</b>  | <b>2009</b>           |
| <i>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA</i>   |                       |
| <b>Member, Technical Excellence Committee</b>   | <b>2008 - Present</b> |
| <i>Small Business Innovation Research Program (SBIR)</i>  |                       |
| <b>Proposal Peer Reviewer</b>   | <b>2000 – Present</b> |
| <i>Applied Optics, Applied Physics B, Chemical Physics Letters, Journal of Molecular Spectroscopy, Science</i>  |                       |
| <b>Peer Reviewer</b>  | <b>1999 – Present</b> |
| <i>NASA Advanced Component Technology Program</i>   |                       |
| <b>Proposal Peer Reviewer</b>   | <b>2008</b>           |
| <i>Earth System Scholars Network (ESSN)</i>   |                       |
| <b>Member, Mission Statement Committee</b>  | <b>2004</b>           |
| <i>National Urban League Conference, Los Angeles, CA, USA</i>   |                       |
| <b>Volunteer, Career Fair for JPL</b>   | <b>July, 2002</b>     |
| <i>Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, USA</i>   |                       |
| <b>Organizer, "Atmospheric Chemistry, Dynamics &amp; Radiation Seminar Series"</b>  | <b>2001 – 2002</b>    |

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PUBLICATIONS

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- Tjoelker, Robert; Prestage, John; Burt, Eric; Chen, Pin; Chong, Yong; Chung, Sang; Diener, William; Ely, Todd; Enzer, Daphna; Mojaradi, Hadi; Okino, Clayton; Pauken, Mike; Robison, David; Swenson, Brad; Tucker, Blake. "Mercury Ion Clock for a NASA Technology Demonstration Mission," *Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, in press.
- Yi, X; Vahala, K; Li, J; Diddams, S; Ycas, G; Plavchan, P; Leifer, S; Sandhu, J; Vasisht, G; Chen, P; Gao, P; Gagne, J; Furlan, E; Bottom, M; Martin, EC; Fitzgerald, MP; Doppmann, G; Beichman, C. "Demonstration of a near-IR line-referenced electro-optical laser frequency comb for precision radial velocity measurements in astronomy," *Nature Communications*, **7**, doi:10.1038/ncomms10436, 2016
- Yung, YL & Chen, P. "Methane on Mars," *Astrobiol. Outreach*, **3**: 125, doi:10.4172/2332-2519.1000125, 2015

- Line, MR; Zhang, X; Vasisht, G; Natraj, V; Chen, P; Yung YL. "Information Content of Exoplanetary Transit Spectra: an Initial Look," *Astrophys. J.*, **749**(93), doi:10.1088/0004-637X/749/1/93, 2011.
- Line, MR; Gautam, V; Chen, P; Angerhausen, D; Yung, YL. "Thermochemistry and Photochemistry in Cooler Hydrogen Dominated Extrasolar Planets: the Case of GJ 436b," *Astrophys. J.*, **738**(32), doi:10.1088/0004-637X/738/1/32, 2011.
- Swain, MR; Deroo, P; Griffith, CA; Tinetti, G; Thatte, A, Vasisht, G; Chen, P; Bouwman, J; Crossfield, IJ; Angerhausen, D; Afonso, C; Henning, T. "A ground-based near-infrared emission spectrum of the exoplanet HD189733b," *Nature*, **463**, doi: 10.1038, 2010.
- Swain, MR; Tinetti, G; Vasisht, G; Deroo, P; Griffith, C; Bouwman, J; Chen, Pin; Yung, Y; Burrows, A. Brown, LR; Matthews, J; Rowe, JF; Kuschnig, R; Angerhausen, D. "Water, methane, and carbon dioxide present in the dayside spectrum of the exoplanet HD 209458b," *Astrophys. J.*, **704**: 1616-1621, 2009.
- Swain, MR; Vasisht, G; Tinetti, G; Bouwman, J; Chen, Pin; Yung, Y; Deming, D; Deroo, P. "Molecular Signatures in the Near Infrared Dayside Spectrum of HD 189733b," *Astrophys. J. Lett.*, **690**: L114-L117, 2009.
- Traub, WA; Chen, P; Kern B.; Matsuo, T. "Planetscope: An Exoplanet Coronagraph on a Balloon Platform." *Proceedings of the SPIE – The International Society for Optical Engineering*, **7010**(70103S), DOI:10.1117/12.788087, 2008.
- Trudeau, ME; Chen, P; de Andrade Garcia, G., Hollberg, LW; Tans, PP. "Stable isotopic analysis of atmospheric methane by infrared spectroscopy using diode laser difference-frequency generation," *Appl. Optics*, **45**(17): 4136-4141, 2006.
- Chen, P; Pearson, JC; Pickett, HM; Matsuura, S; Blake, GA. "Measurements of  $^{14}\text{NH}_3$  in the  $v_2 = 1$  state by a solid-state, photomixing, THz spectrometer and a simultaneous analysis of the microwave, terahertz, and infrared transitions between the ground and  $v_2$  inversion-rotation levels," *J. Mol. Spectrosc.*, **236**(1): 116-126, 2006.
- Kleiner, I; Tarrago, G; Cottaz, C; Sagui, L; Brown, LR; Poynter, RL; Pickett, HM; Chen, P; Pearson, JC; Sams, RL; Blake, GA; Matsuura, S; Nemtchinov, V; Varanasi, P; Fusina, L; Di Lonardo, G. " $\text{NH}_3$  and  $\text{PH}_3$  line parameters: the 2000 HITRAN update and new results." *J. Quant. Spectrosc. Radiat. Transf.*, **82**(1-4): 293-312, 2003.
- Pearson, J.C.; Chen, P.; Pickett, H.M. "Photomixer systems as submillimeter oscillators and coherent test sources." *Proceedings of SPIE - The International Society for Optical Engineering*, **4855**: 459-467, 2003.
- Chen, P; Pearson, JC; Pickett, HM; Matsuura, S; Blake, GA. "Submillimeter-wave measurements and analysis of the ground and  $v_2 = 1$  states of water," *Astrophys. J. Suppl. Ser.*, **128**(1): 371-385, 2000.
- Matsuura, S; Chen, P; Blake, GA; Pearson, JC; Pickett, HM. "A tunable cavity-locked diode laser source for terahertz photomixing," *IEEE Trans. Microw. Theory Tech.*, **48**(3): 380-387, 2000.
- Chen, P; Pearson, JC; Pickett, HM; Matsuura, S; Blake, GA. "A Three-Diode-Laser, Terahertz-Difference-Frequency Synthesizer and Its Applications toward Far-Infrared Spectroscopy of Ammonia and Water," in L. Hollberg and R. J. Lang (Eds.), *Trends in Optics and Photonics: Advanced Semiconductor Lasers and Their Applications vol. 31*, pp. 103-105, Washington, D.C., Optical Society of America, Washington, DC, 2000.
- Matsuura, Shuji; Chen, Pin; Blake, Geoffrey A.; Pearson, J.C.; Pickett, H. M. "Two-frequency MOPA diode laser system for difference frequency generation of coherent THz-waves." *Proceedings of SPIE - The International Society for Optical Engineering*, **3617**: 14-21, 1999.
- Matsuura, S; Chen, P; Blake, GA; Pearson, JC; Pickett, HM. "Simultaneous amplification of terahertz difference frequencies by an injection-seeded semiconductor laser amplifier at 850 nm," *Int. J. Infrared Millimeter Waves*, **19**(6): 849-858, 1998.
- Chen, P; Blake, GA; Gaidis, MC; Brown, ER; McIntosh, KA; Chou, SY; Nathan, MI; Wiliamson, F. "Spectroscopic applications and frequency locking of THz photomixing with distributed-Bragg-reflector diode lasers in low-temperature-grown GaAs," *Appl. Phys. Lett.*, **71**(12): 1601-1603, 1997.

- Young, AT; Chen, P; Leung, KN; Pan, L; Ponce, D; Stutzin, GC. "Laser and spectroscopic diagnostics of H<sup>+</sup> ion-source plasmas," *Rev. Sci. Instrum.*, **65**(4): 1416-1418 Part 2, 1994.
- Young, AT; Stutzin, GC; Chen, P; Kunkel, WB; Leung, KN. "Measurement of Atomic and Molecular-hydrogen in a tandem magnetic multicusp H<sup>+</sup> ion-source by VUV spectroscopy," *Rev. Sci. Instrum.*, **63**(4): 2744-2746 Part 2, 1992.

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CONFERENCE PAPERS (INCOMPLETE LIST)

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- Friedson, A. J., Yung, Y. L., Chen, P., "Testing a Simple Recipe for Estimating Thermal Hydrodynamic Escape Rates in Primitive Terrestrial Atmospheres," *2014 Fall Meeting of the American Geophysical Union*, San Francisco, CA, U.S.A., Dec. 2014.
- Bui, T., Shen L., Hogan, Chen, P., Okumura, M., "Dual Wavelength Cavity Ringdown Spectroscopy for High Precision Methane Isotope Ratio Measurements," *Internal Symposium on Molecular Spectroscopy*, Champaign-Urbana, IL, U.S.A., June, 2014
- Unwin, S., Bryden, G., Stapelfeldt, K., Traub, W., Brugarolas, P., Bruno, R., Chen, P., Krist, J., Mawet, D., Mennesson, B., Moody, D., Roberts, L., Trauger, J., Vasisht, G., Chakrabarti, S., Hillenbrand, L., Lillie, C., Macintosh, B., Percival, J., Rey, J., Stuchlik, D., "Zodiac II: Debris Disk Science from a Balloon," *Exploring Strange New worlds: From Giant Planets to Super Earths*, Flagstaff, AZ, U.S.A., May, 2011.
- Sung, K., Chen, P., Crawford, T.J., "A new approach proposed to Fourier transform spectroscopy using a broad-band laser source," *2010 AGU Fall Meeting*, San Francisco, CA, U.S.A., December, 2010.
- Line, M.R., Chen, P., Yung Y.L., "The Impact of UV Irradiance on the Composition of Exoplanets," *42<sup>nd</sup> annual meeting of the Division for Planetary Sciences of the American Astronomical Society*, Pasadena, CA, U.S.A., October, 2010
- Sung, K., Chen, P., Crawford, T.J., "High Resolution Fourier Transform Spectroscopy in the 1.57  $\mu\text{m}$  Region Using a Frequency Comb Laser Source," *The 11<sup>th</sup> HITRAN Database Conference*, Harvard-Smithsonian Center for Astrophysics, Cambridge, Massachusetts, U.S.A., June 2010.
- Chen, P., Traub, W.A., Kern, B.D., Matsuo, T., "Seeing in the stratosphere," *AAS Bulletin*, **41**(1), 213<sup>th</sup> AAS Meeting, Abstract 475.18, January 2009.
- Swain, M.R., Chen, P., Vasisht, G., "The balloon-borne exoplanet spectroscopy telescope," *AAS Bulletin*, **41**(1), 213<sup>th</sup> AAS Meeting, Abstract 475.20, January 2009.
- Chen, P., Gordon, B., Kern, B., Nemati, B., Shao, M., Traub W., Trauger J., "Stratospheric seeing and contrast limits for a balloon-borne coronagraph," *Exoplanet Science & Technology Fair*, Jet Propulsion Laboratory, California Institute of Technology, Pasadena, CA, U.S.A., February 2008.
- Chen, P., Traub W., Shao, M., Trauger, J., Kern, B., Nemati, B., Netterfield, B., Kasdin, J., "A balloon-borne, planet-characterizing telescope concept," *Navigator Program Forum 2007*, NASA Ames Research Center, CA, U.S.A., May 2007.
- Chen, P., Robichaud, D. J., Yeung L., Okumura M., Yung Y. L., "Noise-immune, cavity-enhanced spectroscopy and ultra-sensitive atmospheric in-situ measurements," *Asia Oceania Geosciences Society 3<sup>rd</sup> Annual Meeting*, Singapore, Jul. 2006.
- Chen P., Robichaud D. J., Okumura M., and Yung Y. L., "A cavity-enhanced, optical-heterodyne spectrometer and its relevance to future Titan exploration," *Astrobiology Science Conference (AbSciCon) 2006*, Washington, D.C., U.S.A., Mar. 2006.
- Chen, P; Robichaud, D; Okumura, M. "Application of cavity enhanced, optical heterodyne spectroscopy to tropospheric isotope chemistry." *Abstr. Pap. Am. Chem. Soc.*, **229**: U722-U722 131-Phys. Part 2, March 13, 2005.
- Chen, P., "Development of a new technique for stable-isotope analysis of tropospheric carbon monoxide based on cavity-enhanced, near-infrared spectroscopy," *First Symposium for the Earth System Scholars Network*, Adelphi, MD, U.S.A., Sep. 2004.

- Chen, P., "Laser spectroscopy for stable-isotopic analysis of atmospheric molecules," *The Ohio State University 58<sup>th</sup> International Symposium on Molecular Spectroscopy*, Columbus, OH, U.S.A., Jun. 2003.
- Chen P., Siegel, P. H., Pickett H. M., Pearson J. C., and Wyss, R. A., "Optoelectronic terahertz sources based on photomixers," *Far-IR, Sub-mm, & mm Detector Technology Workshop*, Monterey, CA, U.S.A., Apr. 2003.
- Chen, P., de Andrade Garcia, G., Hollberg L. W., Trudeau, M. E., and Tans, P. P., "A mid-infrared spectrometer for stable-isotope analysis of tropospheric methane," *2000 Spring Meeting of the American Geophysical Union*, Washington, D. C., U.S.A., May-Jun. 2000.
- Chen, P., Pearson J. C., Pickett, H. M., Matsuura S., and Blake G. A., "Construction of a three-diode-laser, terahertz, difference-frequency synthesizer and its applications toward spectroscopy of ammonia in the  $\nu_2$  state and water in the ground and  $\nu_2$  states," *Sixteenth Colloquium on High Resolution Molecular Spectroscopy*, Dijon, France, Sep. 1999.
- Chen, P., Pearson, J. C., Pickett H. M., Matsuura S., and Blake G. A., "A three-diode-laser, terahertz-difference-frequency synthesizer and its applications toward far-infrared spectroscopy of ammonia and water," *3<sup>rd</sup> Advanced Semiconductor Lasers Applications Meeting*, Santa Barbara, CA, U.S.A., Jul. 1999.
- Chen, P., Matsuura, S., Blake, G. A., Pearson, J. C., and Pickett, H. M., "Molecular spectroscopy with a high-resolution, frequency-calibrated terahertz spectrometer based on optical photomixing in low-temperature-grown GaAs," *The Ohio State University 53<sup>rd</sup> International Symposium on Molecular Spectroscopy*, Columbus, OH, U.S.A., Jun. 1998.
- Chen, P. and Blake, G. A., "Spectroscopic applications of submillimeter generation by an all-solid-state, optical-heterodyne source," *The Ohio State University 52<sup>nd</sup> International Symposium on Molecular Spectroscopy*, Columbus, OH, U.S.A., Jun. 1997.
- Chen, P. and Blake, G. A., "Vibrational-rotational-tunneling spectroscopy of N<sub>2</sub>-D<sub>2</sub>O with an all solid state, optical heterodyne, Submillimeter-wave spectrometer," *The Ohio State University 51<sup>st</sup> International Symposium on Molecular Spectroscopy*, Columbus, OH, U.S.A., Jun. 1996.
- Chen, P. and Blake, G. A., *43<sup>rd</sup> Annual Western Spectroscopy Association Conference*, Pacific Grove, CA, U.S.A., Feb. 1996.
- Chen, P. and Blake, G. A., "Spectroscopic applications of optical photomixing at millimeter and submillimeter frequencies," *The Ohio State University 50<sup>th</sup> International Symposium on Molecular Spectroscopy*, Columbus, OH, U.S.A., Jun. 1995.
- Li, CY; Chen, P; Stutzin, GC; Young, AT; Leung, KN; Kunkel, WB. "Laser diagnostics of the chemical-kinetics of H<sup>-</sup> ion formation in a low-pressure electric-discharge," *Abstr. Pap. Am. Chem. Soc.*, **201**: 177 Part 2, 1991.
- Young, AT; Chen, P; Kunkel, WB; Leung, KN; Li, CY; Stutzin, GC. "Laser diagnostics of H<sup>-</sup> formation in a magnetic multicusp ion source," *Conference Record of 1991 IEEE Particle Accelerator Conference: 1916-1918*, 1991.
- Young, AT; Chen, P; Kunkel, WB; Leung, KN; Li, CY; Watson, JM. "Quantum yield measurements of photocathodes illuminated by pulsed ultraviolet laser radiation," *Conference Record of 1991 IEEE Particle Accelerator Conference: 1993-1995*, 1991.

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#### LANGUAGES

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- Mandarin Chinese – native language
- English – as proficient and fluent as native speakers.
- German – two years of college coursework, very rusty now.

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#### MEMBERSHIPS

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- American Chemical Society (ACS)
- American Geophysical Union (AGU)

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- American Physical Society (APS)
  - Asia Oceana Geosciences Society (AOGS)
  - Division for Planetary Sciences of the American Astronomical Society (DPS)