

CURRICULUM VITAE – November 2011

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BIOGRAPHICAL

Born: 6 May 1959; Greenville, Mississippi.

Married: Karen L. Blake, 1982. One child, Garrett Alexander Blake, b. 14 March 1988.

DEGREES

May, 1981 B. S., *summa cum laude*, with distinction in Chemistry, Duke University, Durham, NC (Physics minor). Thesis advisor - Prof. W.L. Luken.

June, 1986 Ph.D., Chemical Physics, California Institute of Technology, Pasadena, CA. Thesis advisor - Prof. T.G. Phillips (Physics).

PROFESSIONAL HISTORY

6/76-9/76 Summer Research Student, American University and Goddard Space Flight Center, NASA; Greenbelt, Maryland.

Research area: Analysis of airborne and space platform remote sensing measurements of stratospheric ozone profiles.

1/78-9/78 Research Assistant, California Institute of Technology, Pasadena, California. Research area: Recombinant DNA analysis of human δ and β globin genes.

6/79-9/79 Summer Research Assistant, University of Washington, Seattle, Washington. Research area: *in vitro* kinetic and audioradiographic studies of the sodium/potassium pump in *rana pipiens*.

6/80-9/80 NSF REU Student, Duke University, Durham, North Carolina. Research area: *ab initio* quantum mechanical studies of the boron trifluoride/carbon monoxide van der Waals dimer.

6/81-9/81 Summer Research Assistant, Jet Propulsion Laboratory, Pasadena, California. Research area: Ion cyclotron resonance studies of ion-molecule reactions involving astrophysically important sulfur-bearing hydrocarbons.

9/81-9/84 NSF Predoctoral Fellow, California Institute of Technology. Thesis research: Laboratory/astronomical rotational and rovibrational spectroscopy of reactive intermediates at THz frequencies.

6/82-9/82 Summer Researcher, Duke University. Research area: Millimeter and submillimeter spectroscopy of transient species, non-invasive plasma diagnostics.

- 9/85-9/87 Miller Basic Research Postdoctoral Fellow, University of California, Berkeley. Research areas: Infrared and THz spectroscopy of molecular ions and weakly bonded clusters, THz astrophysics. Advisor - Prof. R.J. Saykally (Chemistry)
- 9/87-7/93 Assistant Professor of Cosmochemistry and Planetary Science, Division of Geological and Planetary Sciences, California Institute of Technology.
- 7/93-7/97 Associate Professor of Cosmochemistry and Planetary Science, Division of Geological and Planetary Sciences, California Institute of Technology.
- 7/97-9/99 Professor of Cosmochemistry and Planetary Science, Division of Geological and Planetary Sciences, California Institute of Technology.
- 9/99- Professor of Chemistry, Division of Chemistry and Chemical Engineering, California Institute of Technology.
Research areas: Observational analyses of stellar and planetary genesis; THz high resolution spectroscopy and sub-ps photocarrier dynamics of hydrogen bonded and semiconductor materials; *in situ* characterization of the Earth's atmosphere and biogeochemical cycles.
- 7/09- Caltech Master of Student Houses (MOSH).

HONORS AND AWARDS

- 6/77 National Space Club Award for Research.
- 5/80 Phi Lambda Upsilon, Phi Lambda Upsilon Award for Outstanding Rising Senior, NSF REU Student, Duke University.
- 5/81 Phi Beta Kappa, Sigma Xi, *summa cum laude*, Chemistry Department Award for Outstanding Undergraduate Thesis, Duke University.
- 9/81-9/84 NSF Predoctoral Fellow, California Institute of Technology.
- 9/85-9/87 Miller Basic Research Fellow, University of California, Berkeley.
- 9/87-9/88 Boeing Faculty Development Fund, California Institute of Technology.
- 9/87-9/88 IBM Young Faculty Development Fund, California Institute of Technology.
- 9/88-9/93 David and Lucille Packard Fellow, California Institute of Technology.
- 9/89-9/91 Alfred P. Sloan Research Fellow, California Institute of Technology.
- 6/89-6/94 NSF Presidential Young Investigator, California Institute of Technology.
- 12/04 Raymond & Beverley Sackler Lecture in Astrophysics, Leiden University.
- 11/08-5/09 Beatrice Tinsley Centennial Visiting Professor in Astronomy, UT Austin.

PROFESSIONAL ACTIVITIES

- 10/89 NASA Workshop on Submillimeter Planning (report available).
- 10/89-7/90 Science with the Millimeter Array Workshop (NSF document available).
- 3/90-8/93 Origins of Solar Systems Review Panel, OSS, NASA.
- 3/91-6/92 Research and Analysis Study Committee, SSED, NASA (report available).
- 8/92-8/95 Solar System Exploration Division Advisory Committee, OSS, NASA.
- 4/92-4/96 Co-Chair, OSA Topical Meetings on High Resolution Spectroscopy.
- 2/96-11/97 Member, Defense Science Study Group, DoD.
- 6/94-6/97 Origins of Solar Systems MOWG, OSS, NASA.

9/97-9/99 Millimeter Advisory Committee, NSF/NRAO Millimeter Array Project.
8/98-10/99 Exobiology Program Review Panel, OSS, NASA.
6/98-12/99 Panel on Radio & Submillimeter-Wave Astronomy, NAS Astronomy and
Astrophysics Decadal Survey Committee
9/99-4/03 ALMA Science Advisory Committee (3/01-9/01 Vice Chair, 9/01-3/02 Chair)
11/99-7/03 Member, NRAO Visiting Committee
1/90- Project SEED/CAPSI Science Professional, Pasadena Unified District.
1/02-11/04 Member, Spitzer Science Center Oversight Committee
2/00-6/06 Deputy Director, Owens Valley Radio Observatory
9/01-9/06 Member, SOFIA Science Steering Committee
7/06-7/10 Faculty Chair, Undergraduate Admissions, Caltech

HUMAN RESOURCES CONTRIBUTIONS AND RESEARCH COLLEAGUES

Undergraduate Students Supervised (1987-present)

Ms. Nicole Adelstein (Reed), Ms. Maryam Ali, Mr. Richard Balterzan, Ms. Caryn Bell (UMBC), Mr. Zach Berger, Ms. Catherine Boone, Ms. Janet Bowen, Ms. Gina Buccolo, Mr. Abraham Buditama, Ms. Frances Chance, Ms. Shirley Chen, Mr. Kevin Cossel, Ms. Nadine Curry, Ms. Kathryn Dyl, Mr. Matthew Harrigan, Mr. Thomas Heavey, Ms. Jennifer Herman, Ms. Kristen Holtz, Mr. Marinus Israel (Leiden), Mr. Timothy Jones, Mr. J.B. Khanyille (Richmond), Ms. Stacy Kim, Mr. Ted Koenig, Ms. Janet Lai, Ms. J.-Y. Li, Mr. Benjiman Lin, Ms. Karin Öberg, Mr. David Rischer, Ms. Nitzan Roth, Mr. Kevin Sutherland, Ms. Justine Tawel (Carleton), Ms. Jamie Tayar, Ms. Elanor Waxman

Graduate Students Supervised (1988-present)

Dr. Todd Groesbeck (Physics, Prof. T.G. Phillips, primary advisor); Mr. Marco Allodi, Dr. Rogier Braakman, Dr. Pin Chen, Ms. Sijia Dong, Mr. Daniel Holland, Dr. Vadym Kapinus, Mr. Matthew Kelley, Ms. Melissa Kelly (M.S.), Dr. Jacqueline Kessler-Silacci, Mr. Michael Morton (M.S), Dr. David Rodham, Dr. Paul Stockman, Dr. Sakae Suzuki, Dr. Susanna Widicus Weaver, Dr. Sheng Wu (Chemistry); Dr. Mao-Chang Liang (w/Prof. Y.L. Yung), Ms. Alexandra Lockwood, Dr. Stuart McMuldloch (w/Prof. A.I. Sargent), Dr. Colette Salyk, Dr. Hui Zhang (w/Prof. P.O. Wennberg, Planetary Science); Dr. Joanna Brown, Ms. Ke Zhang (Astronomy)

Postdoctoral Research Fellows Supervised (1988-present)

Dr. Roger Bumgarner, Dr. Peter Green, Dr. Shuji Matsuura, Dr. Zulfikar Morbi, Dr. Adwin Boogert, Dr. Rowin Meijerink, Dr. Klaus Pontoppidan (Hubble Fellow), Dr. Rachel Smith
Dr. Jim Kubicki (with Prof. E.M. Stolper), Dr. Zifu Wang (with Prof. G.R. Rossman), Dr. Thom Rahn (with Prof. J. Eiler), Dr. Amir Yeganeh-Hauri (with Prof. T.J. Ahrens), Dr. Francois Jeanneret (with Prof. P.O. Wennberg)

Current & Recent Collaborators

Prof. P.O. Wennberg – Non-linear light sources/*in situ* studies of atmospheric chemistry.
Prof. A.I. Sargent – Millimeter-wave studies of T Tauri and Herbig Ae stars.
Prof. L.G. Mundy, Univ. of Maryland, Prof. N.J. Evans II, UT Austin – Multi-wavelength continuum and spectral line studies of deeply embedded young stellar objects (YSOs).

Profs. E.F. van Dishoeck & M.R. Hogerheijde, Leiden University – Observational and theoretical characterization of the chemistry in molecular clouds and YSOs.

REFEREED PUBLICATIONS

- [1] “The Isolation and Characterization of Linked δ - and β -Globin Genes from a Cloned Library of Human DNA” Richard M. Lawn, Edward F. Fritsch, Richard C. Parker, Geoffrey Blake, & Tom Maniatis 1978, *Cell* **15**, 1157.
- [2] “Laboratory Millimeter and Submillimeter Spectrum of HOC^+ ” Geoffrey A. Blake, Paul Helminger, Eric Herbst, & Frank C. De Lucia 1983, *Ap. J.(Letters)* **264**, L69.
- [3] “The Production of Large Concentrations of Molecular Ions in the Lengthened Negative Glow Region of a Discharge” Frank C. De Lucia, Eric Herbst, Grant M. Plummer, & Geoffrey A. Blake 1983, *J. Chem Phys.* **78**, 2312.
- [4] “First Detection of the Ground State $J_K=1_0 \rightarrow 0_0$ Submm Transition of Interstellar NH_3 ” Jocelyn Keene, Geoffrey A. Blake, & Thomas G. Phillips 1983, *Ap. J.(Letters)* **271**, L27.
- [5] “The Millimeter and Submillimeter Spectrum of CN in its First Four Vibrational States” David D. Skatrud, Frank C. De Lucia, Geoffrey A. Blake, & K.V. Sastry 1983, *J. Mol. Spec.* **99**, 35.
- [6] “The Laboratory Millimeter and Submillimeter Spectrum of HCO” Geoffrey A. Blake, K.V. Sastry, & Frank C. De Lucia 1984, *J. Chem. Phys.* **80**, 95.
- [7] “The Millimeter and Submillimeter Spectrum of Methyl Formate in its Ground Symmetric Torsional State” Grant M. Plummer, Eric Herbst, Frank C. De Lucia, & Geoffrey A. Blake 1984, *Ap. J. Suppl.* **55**, 633.
- [8] “On the Interpretation of the Broad-Band Mm-Wave Flux from Orion” Edward C. Sutton, Geoffrey A. Blake, C.R. Masson, & Thomas G. Phillips 1984, *Ap. J.(Letters)* **283**, L41.
- [9] “Ion-molecule Reactions in Unsaturated Hydrocarbons: Allene, Propyne, Diacetylene, and Vinylacetylene” Vince G. Anicich, Geoffrey A. Blake, Jhong K. Kim, Murray J. McEwan, & Wesley T. Huntress, Jr. 1984, *J. Phys. Chem.* **88**, 4608.
- [10] “ $^{13}\text{CH}_3\text{OH}$ in OMC-1” Geoffrey A. Blake, Edward C. Sutton, Colin R. Masson, Thomas G. Phillips, Eric Herbst, Grant M. Plummer, & Frank C. De Lucia 1984, *Ap. J.* **286**, 586.
- [11] “Interaction Optimized Virtual Orbitals III: Single Excitations” William L. Luken, Barbara A.B. Seiders, & Geoffrey A. Blake 1985, *Chem. Phys.* **92**, 255.
- [12] “Generation of Continuously Tunable Laser Sidebands in the Far-Infrared Region” Jam Farhoomand, Geoffrey A. Blake, Margaret A. Frerking, & Herbert M. Pickett 1985, *J. Appl. Phys.* **57**, 1763.
- [13] “Direct Measurement of the Fundamental Rotational Transitions of the OH Radical by Laser Sideband Spectroscopy” Jam Farhoomand, Geoffrey A. Blake, & Herbert M. Pickett 1985, *Ap. J.(Letters)* **291**, L19.
- [14] “Molecular Line Survey of Orion A from 215 and 247 GHz” Edward C. Sutton, Geoffrey A. Blake, Colin R. Masson, & Thomas G. Phillips 1985, *Ap. J. Suppl.* **58**, 341.
- [15] “Interstellar H_3^+ : Possible Detection of the $1_{10} \rightarrow 1_{11}$ Transition of H_2D^+ ” Thomas G. Phillips, Geoffrey A. Blake, Jocelyn Keene, R. Claude Woods, & Ed Churchwell 1985, *Ap. J.(Letters)* **294**, L45.
- [16] “Chlorine in Dense Interstellar Clouds: The Abundance of HCl in OMC-1” Geoffrey A. Blake, Jocelyn Keene, & Thomas G. Phillips 1985, *Ap. J.* **295**, 501.

- [17] “The Abundance of Atomic Carbon Near the Ionization Fronts in M17 and S140” Jocelyn Keene, Geoffrey A. Blake, Thomas G. Phillips, Patrick J. Huggins, & Charles A. Beichman 1985, *Ap. J.* **299**, 967.
- [18] “The Chemistry of Chlorine in Dense Interstellar Clouds” Geoffrey A. Blake, Vince G. Anicich, & Wesley T. Huntress, Jr. 1986, *Ap. J.* **300**, 415.
- [19] “The Far-Infrared Rotational Spectrum of X²Π OH” Geoffrey A. Blake, Jam Farhoomand, & Herbert M. Pickett 1986, *J. Mol. Spec.* **115**, 226.
- [20] “The Rotational Emission Line Spectrum of Orion A Between 247-263 GHz” Geoffrey A. Blake, E.C. Sutton, C.R. Masson, & Thomas G. Phillips 1986, *Ap. J. Suppl.* **60**, 357.
- [21] “The Millimeter and Submillimeter Spectrum of Methyl Formate in its Antisymmetric Torsional State” Grant M. Plummer, Eric Herbst, Frank C. De Lucia, & Geoffrey A. Blake 1986, *Ap. J. Suppl.* **60**, 949.
- [22] “Direct Measurement of the Fine Structure Interval and g_J Factors of Singly Ionized Atomic Carbon by Laser Magnetic Resonance” Andrew L. Cooksy, Geoffrey A. Blake, & Richard J. Saykally 1986, *Ap. J. (Letters)* **305**, L89.
- [23] “Excitation of Methyl Cyanide in the Orion Hot Core” Edward C. Sutton, Geoffrey A. Blake, Reinhard Genzel, Colin R. Masson, & Thomas G. Phillips 1986, *Ap. J.* **311**, 921.
- [24] “Determination of the Born-Oppenheimer Potential Function of CCl⁺ by Velocity Modulation Diode Laser Spectroscopy” Martin Gruebele, Mark Polak, Geoffrey A. Blake, & Richard J. Saykally 1986, *J. Chem. Phys.* **85**, 6256.
- [25] “Comparison of Submillimeter and UV Observations of Neutral Carbon Towards Zeta Oph” Jocelyn Keene, Geoffrey A. Blake, & Thomas G. Phillips 1986, *Ap. J.* **313**, 396.
- [26] “Determination of the Electric Dipole Moment of ArH⁺ by the Rotational Zeeman Effect with a Tunable Far-Infrared Laser” Kenneth B. Laughlin, Geoffrey A. Blake, Ronald C. Cohen, David C. Hovde, & Richard J. Saykally 1987, *Phys. Rev. Lett.* **58**, 996.
- [27] “Molecular Abundances in OMC-1: The Chemical Composition of Interstellar Molecular Clouds and the Influence of Massive Star Formation” Geoffrey A. Blake, Edward C. Sutton, Colin R. Masson, & Thomas G. Phillips 1987, *Ap. J.* **315**, 621.
- [28] “Laboratory Measurements of the Pure Rotational Spectrum of Vibrationally Excited HCO⁺ ($\nu_2 = 1$) by Far-Infrared Laser Sideband Spectroscopy” Geoffrey A. Blake, Kenneth B. Laughlin, Ronald C. Cohen, Kerry L. Busarow, & Richard J. Saykally 1987, *Ap. J. (Letters)* **316**, L76.
- [29] “Tunable Far-IR Laser Spectroscopy in a Planar Supersonic Jet: The Σ Bending Vibration of Ar-HCl” Kerry L. Busarow, Geoffrey A. Blake, Kenneth B. Laughlin, Ronald C. Cohen, Yuan T. Lee, & Richard J. Saykally 1987, *Chem. Phys. Lett.* **141**, 289.
- [30] “Tunable Far-IR Laser Spectroscopy of van der Waals Bonds: Extended Measurements on the Σ Bend of Ar-HCl” Kerry L. Busarow, Geoffrey A. Blake, Kenneth B. Laughlin, Ronald C. Cohen, Yuan T. Lee, & Richard J. Saykally 1988, *J. Chem. Phys.* **89**, 1268.
- [31] “Tunable Far-IR Laser Spectroscopy of Hydrogen Bonds: The $K_a = 0(u) \rightarrow 1(g)$ Tunneling-Rotation Spectrum of the HCl Dimer” Geoffrey A. Blake, Kerry L. Busarow, Ronald C. Cohen, K.B. Laughlin, Yuan T. Lee, & Richard J. Saykally 1988, *J. Chem. Phys.* **89**, 6577.

- [32] “Tunable Far-IR Laser Spectroscopy of van der Waals Bonds: Vibration-Rotation-Tunneling Spectra of Ar-H₂O” Ronald C. Cohen, K.L. Busarow, K.B. Laughlin, Geoffrey A. Blake, M.L. Havenith, Y.T. Lee, & Richard J. Saykally 1988, *J. Chem. Phys.* **89**, 4494.
- [33] “Experimental Determination of Dipole Moments for Molecular Ions: Improved Measurements for ArH⁺” Kenneth B. Laughlin, Geoffrey A. Blake, Ronald C. Cohen, & Richard J. Saykally 1989, *J. Chem. Phys.* **90**, 1358.
- [34] “Measurement of the Perpendicular Rotation-Tunneling Spectrum of the Water Dimer by Tunable Far-Infrared Laser Spectroscopy in a Planar Supersonic Jet” Kerry L. Busarow, Ronald C. Cohen, Geoffrey A. Blake, Kenneth B. Laughlin, Yuan T. Lee, & Richard J. Saykally 1989, *J. Chem. Phys.* **90**, 3937.
- [35] “The Abundances of Atomic Carbon and Carbon Monoxide Compared with Visual Extinction in the Ophiuchus Molecular Cloud Complex” Margaret A. Frerking, Jocelyn Keene, Geoffrey A. Blake, & Thomas G. Phillips 1989, *Ap. J.* **344**, 311.
- [36] “Microwave Direct Absorption Spectroscopy of Weakly Bound Clusters in a Planar Supersonic Jet: Spectra of Ar-HCN and (HCN)₂ from 17.4 - 76.7 GHz” Roger E. Bumgarner & Geoffrey A. Blake 1989, *Chem. Phys. Lett.* **161**, 308.
- [37] “Direct Measurement of the HCl Dimer Tunneling Rates and Cl Isotope Dependence by Far-Infrared Laser Sideband Spectroscopy of Supersonic Jets” Geoffrey A. Blake & Roger E. Bumgarner 1989, *J. Chem. Phys.* **91**, 7300.
- [38] “Tunable Far Infrared Laser Spectroscopy of Deuterated Isotopomers of Ar-H₂O” Sakae Suzuki, Roger E. Bumgarner, Paul A. Stockman, Peter G. Green, & Geoffrey A. Blake 1991, *J. Chem. Phys.* **94**, 824.
- [39] “Microwave and Tunable Far-IR Laser Spectroscopy of H₂O-CO: Investigation of the Water Tunneling Potential” Roger E. Bumgarner, Sakae Suzuki, Paul A. Stockman, Peter G. Green, & Geoffrey A. Blake 1991, *Chem. Phys. Lett.* **176**, 123.
- [40] “The Berkeley Tunable Far Infrared Laser Spectrometers” Geoffrey A. Blake, Kenneth B. Laughlin, Ronald C. Cohen, Kerry L. Busarow, Duo H. Gwo, Charles A. Schmuttenmaer, David W. Steyert, & Richard J. Saykally 1991, *Rev. Sci. Instr.* **62**, 1701.
- [41] “Molecular Line Survey of Sgr B2(M) from 330 to 355 GHz and Comparison with Sgr B2(N)” Edward C. Sutton, Paul A. Jaminet, Willaim C. Danchi, & Geoffrey A. Blake 1991, *Ap. J. Suppl.* **77**, 255.
- [42] “IRAS 16293-2422: A Very Young Binary System?” Lee G. Mundy, H. Alwyn Wootten, Bruce A. Wilking, Geoffrey A. Blake, & Anneila I. Sargent 1992, *Ap. J.* **385**, 306.
- [43] “Microwave and Tunable Far-Infrared Laser Spectroscopy of the Ammonia-Water Dimer” Paul A. Stockman, Roger E. Bumgarner, Sakae Suzuki, & Geoffrey A. Blake 1992, *J. Chem. Phys.* **96**, 2496.
- [44] “Chemistry in Circumstellar Disks: CS Toward HL Tauri” Geoffrey A. Blake, Ewine F. van Dishoeck, & Anneila I. Sargent 1992, *Ap. J.(Letters)* **391**, L99.
- [45] “Laser Induced Isotopic Selectivity in the Resonance Ionization of Os” Rainer K. Wunderlich, Ian D. Hutcheon, Gerald J. Wasserburg, & Geoffrey A. Blake 1992, *Int. J. Mass Spec. Ion Proc.* **115**, 123.
- [46] “Ground-Based Searches for Interstellar H₂D⁺” Ewine F. van Dishoeck, Thomas G. Phillips, Jocelyn B. Keene, & Geoffrey A. Blake 1992, *Astr. Ap.* **261**, L13.

- [47] "Benzene Forms Hydrogen Bonds with Water" Sakae Suzuki, Peter G. Green, Siddarth Dasgupta, William A. Goddard, & Geoffrey A. Blake 1992, *Science* **257**, 942.
- [48] "Multidimensional Hydrogen Tunneling Dynamics in the Ground Vibrational State of the Ammonia Dimer" Jennifer G. Loeser, Charles A. Schmuttenmaer, Ronald C. Cohen, Matthew J. Elrod, Richard J. Saykally, Roger E. Bumgarner, & Geoffrey A. Blake 1992, *J. Chem. Phys.* **97**, 4727.
- [49] "The Structure and Chemistry of Orion-S" Joseph P. McMullin, Lee G. Mundy, & Geoffrey A. Blake 1993, *Ap. J.* **405**, 599.
- [50] "Improved Ground State Rotational Constants for the Argon-Hydrogen Fluoride Dimer" Paul A. Stockman & Geoffrey A. Blake 1993, *J. Chem. Phys.* **98**, 4307.
- [51] "Hydrogen Bonding in the Benzene-Ammonia Dimer" Dave Rodham, Sakae Suzuki, Richard Suenram, Fancis J. Lovas, Siddarth Dasgupta, William A. Goddard III, & Geoffrey A. Blake 1993, *Nature* **362**, 735.
- [52] "Laser Induced Isotopic Effects in Ti Resonance Ionization" Rainer K. Wunderlich, Ian D. Hutcheon, Gerald J. Wasserburg, & Gefffrey A. Blake 1993, *Anal. Chem.* **65**, 1411.
- [53] "HF-Cl₂: Bending Dynamics of an Antihydrogen-Bonded van Der Waals Dimer" Paul A. Stockman, Peter G. Green, & Geoffrey A. Blake 1993, *Chem. Phys. Lett.* **212**, 298.
- [54] "The Circumstellar Environment of the Pre-FU Orionis Outburst Candidate V1331 Cygni" Stuart McMuldloch, Anneila I. Sargent, & Geoffrey A. Blake 1993, *A.J.* **106**, 2477.
- [55] "Millimeter and Centimeter Observations of Young Stellar Objects in the Serpens Molecular Core" Joseph P. McMullin, Lee G. Mundy, Bruce A. Wilking, Terence Hezel, & Geoffrey A. Blake 1994, *Ap. J.* **424**, 222.
- [56] "Evidence for HCO⁺ Infall Toward T Tauri?" Huib Jan van Langevelde, Ewine F. van Dishoeck, & Geoffrey A. Blake 1994, *Ap. J. (Letters)* **425**, L45.
- [57] "Molecular Abundances and Low Mass Star Formation I. Si- and S-Bearing Species Towards IRAS 16293-2422" Geoffrey A. Blake, Ewine F. van Dishoeck, David Jansen, Todd D. Groesbeck, & Lee G. Mundy 1994, *Ap. J.* **428**, 680.
- [58] "The Spatial Distribution of Excited H₂ in T Tau: A Molecular Outflow in a Young Binary System" Huib Jan van Langevelde, Ewine F. van Dishoeck, Paul P. van der Verff, & Geoffrey A. Blake 1994, *Astr. Ap.* **287**, L25.
- [59] "The Molecular Line Emission Spectrum of IRC+10216 Between 330 and 358 GHz" Todd D. Groesbeck, Thomas G. Phillips, & Geoffrey A. Blake 1994, *Ap. J. Suppl.* **94**, 147.
- [60] "Pseudorotation in the D₂O Trimer" Sakae Suzuki & Geoffrey A. Blake 1994, *Chem. Phys. Lett.*, **229**, 499.
- [61] "The Circumstellar Environment of IRAS 05338-0624" Joseph P. McMullin, Lee G. Mundy, & Geoffrey A. Blake 1994, *Ap.J.* **437**, 305.
- [62] "A Molecular Line Study of the Young Stellar Object NGC 1333 IRAS 4" Geoffrey A. Blake, Todd Groesbeck, Lee G. Mundy, Ewine F. van Dishoeck, & Goeran Sandell 1995, *Ap. J.* **441**, 689.
- [63] "HCl Absorption Toward Sagittarius B2" J. Zmuidzinas, Geoffrey A. Blake, John Carlstrom, Jocelyn Keene, & David Miller 1995, *Ap.J. (Letters)* **447**, L125.
- [64] "The FU Orionis Binary System RNO 1B/1C" Stuart McMuldloch, Geoffrey A. Blake, & Anneila I. Sargent 1995, *A.J.* **110**, 354.

- [65] “Molecular Abundances and Low Mass Star Formation II. Organic and Deuterated Species Towards *IRAS* 16293-2422”, Ewine F. van Dishoeck, Geoffrey A. Blake, David Jansen, & Todd D. Groesbeck 1995, *Ap. J.* **447**, 760.
- [66] “G2 Theory Calculations on the Proton Affinities of $[\text{H}_4\text{SiO}_4]$, $[\text{H}_4\text{AlO}_4]^-$ and $[\text{H}_5\text{AlO}_4]$ ” James D. Kubicki, Sabine E. Apitz, & Geoffrey A. Blake 1995, *Physics and Chemistry of Minerals* **22**, 481.
- [67] “Ab Initio Calculations on Aluminosilicate Q^3 Species: Implications for Atomic Structures of Mineral Surfaces and the Dissolution Mechanisms of Feldspars” James D. Kubicki, Geoffrey A. Blake, & Sabine E. Apitz 1996, *American Mineralogist* **81**, 789.
- [68] “A $\lambda=1.3$ mm Aperture Synthesis Molecular Line Survey of Orion KL” Geoffrey A. Blake, Lee G. Mundy, John E. Carlstrom, Steve Padin, Steve L. Scott, Nicholas Z. Scoville, & David P. Woody 1996, *Ap.J.(Letters)* **472**, L49.
- [69] “Molecular Orbital Models of Aqueous Aluminum-Acetate Complexes” James D. Kubicki, Geoffrey A. Blake, & Sabine E. Apitz 1996, *Geochim. Cosmochim. Acta* **60**, 4897.
- [70] “ZEKE-PFI Spectroscopy of 1:1 Complexes of Sodium with Water and Ammonia” David Rodham & Geoffrey A. Blake 1997, *Chem. Phys. Lett.* **264**, 522.
- [71] “Molecular Orbital Calculations for Modeling Acetate-Aluminosilicate Adsorption and Dissolution Reactions” James D. Kubicki, Geoffrey A. Blake, & Sabine E. Apitz 1997, *Geochim. Cosmochim. Acta* **61**, 1031.
- [72] “A 325 to 360 GHz Emission Line Survey of the Orion KL Region” Peter Schilke, Todd Groesbeck, Geoffrey A. Blake, & Thomas G. Phillips 1997, *Ap. J. Suppl.* **108**, 301.
- [73] “A Simple, High Performance Type II BBO OPO” Sheng Wu, Geoffrey A. Blake, Zhou Sung, & Ju Ling 1997, *Applied Optics* **36**, 5898.
- [74] “Microwave Spectroscopy of the Methanol-Water Dimer” Paul Stockman, Richard Suenram, Francis J. Lovas, & Geoffrey A. Blake 1997, *J. Chem. Phys.* **107**, 3782.
- [75] “Spectroscopic Applications and Frequency Locking of THz Photomixing with Distributed-Bragg-Reflector Diode Lasers in Low Temperature Grown GaAs” Pin Chen, Geoffrey A. Blake, Michael C. Gaidis, Elliott R. Brown, Kevin A. McIntosh, Steve Y. Chou, Michael I. Nathan, & Fred Williamson 1997, *Appl. Phys. Lett.* **71**, 1601.
- [76] “The Physical and Chemical Structure of Young Stellar Objects I. Dust Mass and Gas Density of the Circumstellar Envelopes” Michiel R. Hogerheijde, Geoffrey A. Blake, Huib Jan van Langevelde, & Ewine F. van Dishoeck 1997, *Ap. J.* **489**, 293.
- [77] “Sub-Arcsecond Imaging at 267 GHz of a Young Binary System: Detection of a <70 AU Disk around T Tau N” Michiel R. Hogerheijde, Huib Jan van Langevelde, Lee G. Mundy, Geoffrey A. Blake, & Ewine F. van Dishoeck 1997, *Ap.J.(Letters)* **490**, L99.
- [78] “High Resolution PFI-ZEKE Photoelectron Spectroscopy of the $\text{Na}(\text{H}_2\text{O})$ Complex” Kwanghsi Wang, David A. Rodham, Vincent McKoy, & Geoffrey A. Blake 1998, *J. Chem. Phys.* **108**, 4817.
- [79] “A New Microsampling Visible-Infrared Spectrometer Based on Optical Parametric Oscillator Technology” Zhou Wang, George R. Rossman, & Geoffrey A. Blake 1998, *Spectroscopy* **13**, 44.

- [80] “Envelope Structure on 700 AU Scales and the Molecular Outflows of Low-Mass Young Stellar Objects” Michiel R. Hogerheijde, Ewine F. van Dishoeck, Geoffrey A. Blake, & Huib Jan van Langevelde 1998, *Ap. J.* **502**, 315.
- [81] “Two-Frequency Operation of an Injection-Seeded Semiconductor Laser Amplifier at 850 nm” Shuji Matsuura, Pin Chen, Geoffrey A. Blake, John C. Pearson, Timothy J. Crawford, & Herbert M. Pickett 1998. *Int. J. Infra. & MM Waves* **19**, 849.
- [82] “Detection of Water Ice on Nereid” Michael E. Brown, Christopher D. Koresko, & Geoffrey A. Blake 1998, *Ap. J. (Letters)* **508**, L175.
- [83] “Stable Isotope Fractionation in the Ultraviolet Photolysis of N₂O” Thom Rahn, Hui Zhang, Martin Whalen, & Geoffrey A. Blake 1998, *Geophys. Res. Lett.* **25**, 4489.
- [84] “A Nanosecond Optical Parametric Generator/Amplifier Seeded by an External Cavity Diode Laser” Sheng Wu, V.A. Kapinus, & Geoffrey A. Blake 1999, *Opt. Comm.* **159**, 74.
- [85] “Sublimation from Icy Jets as a Probe of the Interstellar Volatile Content of Comets” Geoffrey A. Blake, Chunhua Qi, Michiel R. Hogerheijde, Mark A. Gurwell, & Duane O. Muhleman 1999, *Nature* **398**, 213.
- [86] “Envelope Structure of Deeply Embedded Young Stellar Objects in the Serpens Molecular Cloud” Michiel R. Hogerheijde, Ewine F. van Dishoeck, Jante M. Salverda, & Geoffrey A. Blake 1999, *Ap. J.* **513**, 350.
- [87] “A Traveling-Wave THz Photomixer Based on Angle-Tuned Phase Matching” Shuji Matsuura, Geoffrey A. Blake, Rolf A. Wyss, J.C. Pearson, Christoph Kadow, Andrew W. Jackson, & Arthur C. Gossard 1999, *Appl. Phys. Lett.* **74**, 2872.
- [88] “Molecular Models of Benzene and Selected PAHs in the Gas, Aqueous & Adsorbed States” James D. Kubicki, Geoffrey A. Blake, & S.E. Aplitz 1999, *Env. Toxic. Chem.* **18**, 1656.
- [89] “ISO-SWS Detection of H₂ Pure Rotational Lines from the GG Tau Binary System” W.F. Thi, Ewine F. van Dishoeck, Geoffrey A. Blake, G.J. van Zadelhoff, & Michiel R. Hogerheijde 1999, *Ap. J. (Letters)* **521**, L63.
- [90] “The Impact of the Massive Young Star GL 2591 on its Circumstellar Material. I. Temperature and Density Distributions on 100-20,000 AU Scales” Floris van der Tak, Ewine F. van Dishoeck, Neal J. Evans, & Geoffrey A. Blake 1999, *Ap. J.* **522**, 991.
- [91] “Imaging the Haro 6-10 Infrared Companion” Chris Koresko, Geoffrey A. Blake, Michael E. Brown, Anneila I. Sargent, & David W. Koerner 1999, *Ap. J. (Letters)* **525**, L49.
- [92] “Multicrystal Harmonic Generator that Compensates for Thermally Induced Phase Mismatch” S. Wu, G.A. Blake, S. Sun, & J. Ling 2000, *Opt. Commun.* **173**, 371.
- [93] “The Faint Young Sun Paradox: An Observational Test of an Alternative Solar Model” Eric J. Gaidos, Manuel Güdel, & Geoffrey A. Blake 2000, *Geophys. Res. Lett.* **27**, 501.
- [94] “A Tunable, Cavity-Locked Diode Laser System for Terahertz Photomixing” Shuji Matsuura, Pin Chen, Geoffrey A. Blake, John C. Pearson, & Herbert M. Pickett 2000, *I.E.E.E. Micro. Th. & Tech.* **48**, 380.
- [95] “A Spectral Line Study of the Serpens S68 FIRS1 Region” J.P. McMillin, L.G. Mundy, Geoffrey A. Blake, B.A. Wilking, J. Mangum, & W.B. Latter 2000, *Ap. J.* **536**, 845.
- [96] “Submillimeter-Wave Measurements and Analysis of the Ground and $\nu_2 = 1$ States of Water” Pin Chen, J.C. Pearson, Shuji Matsuura, Geoffrey A. Blake, & Herbert M. Pickett 2000, *Ap. J. Suppl.* **128**, 371.

- [97] “Fractionation of $^{14}\text{N}^{15}\text{N}^{16}\text{O}$ & $^{15}\text{N}^{14}\text{N}^{16}\text{O}$ During Photolysis at 213 nm” Hui Zhang, Paul O. Wennberg, Vincent H. Wu, & Geoffrey A. Blake 2000, *Geophys. Res. Lett.* **27**, 2481.
- [98] “Positionally Dependent ^{15}N Fractionation Factors in the UV Photolysis of N_2O Determined by High Resolution FTIR Spectroscopy” F. Turatti, D.W. Griffith, M.B. Esler, T. Rahn, H. Zhang & G.A. Blake 2000, *Geophys. Res. Lett.* **27**, 2489.
- [99] “Structure and Evolution of the Envelopes of Deeply Embedded Massive Young Stars” Floris F.S. van der Tak, Ewine F. van Dishoeck, Neal J. Evans II, & Geoffrey A. Blake 2000, *Ap. J.* **537**, 283.
- [100] “Self Assembled ErAs-islands in GaAs for Optical-Heterodyne THz Generation” C. Kadow, A.Jackson, A.C. Gossard, S. Matsuura, & G.A. Blake 2000, *Appl. Phys. Lett.* **76**, 3510.
- [101] “Far-Infrared Spectroscopy of FU Ori Objects: ISO-LWS Observations” D. Lorenzetti, T. Giannini, B. Nisini, M. Benedettini et al. 2000 (15 authors), *Astron. Ap.* **357**, 1035.
- [102] “Near-Infrared Spectroscopy of the Bright Kuiper Belt Object 2000 EB173” Michael E. Brown, Geoffrey A. Blake, & Jacqueline E. Kessler 2000, *Ap. J.(Letters)* **543**, L163.
- [103] “Substantial Reservoirs of Molecular Gas in the Debris Disks around Young Stars” Wing-Fai Thi, Geoffrey A. Blake, Ewine F. van Dishoeck, G.J. van Zadelhoff, J. Horn, E.E. Becklin, V. Mannings, A.I. Sargent, M. van den Ancker, & A. Natta 2001, *Nature* **409**, 60.
- [104] “Spectral Energy Distributions of Passive T Tauri and Herbig Ae/Be Disks: Grain Mineralogy, Parameter Dependences, and Comparison with ISO LWS Observations” E.I. Chiang, M.K. Joungh, M.J. Creech-Eakman, C. Qi, J. Kessler, G.A. Blake, & E.F. van Dishoeck 2001, *Ap. J.* **547**, 1077.
- [105] “Submillimeter Lines from the Circumstellar Disks around Pre-Main Sequence Stars” Gerd-Jan van Zadelhoff, Ewine F. van Dishoeck, Wing-Fai Thi, & Geoffrey A. Blake 2001, *Astron. Ap.* **377**, 566.
- [106] “ H_2 and CO Rotational Line Emission from the Disks around T Tauri and Herbig Ae Stars” Wing-Fai Thi, Ewine F. van Dishoeck, Geoffrey A. Blake, Gerd-Jan van Zadelhoff, J. Horn, E.E. Becklin, V. Mannings, A.I. Sargent, M.E. van den Ancker, & A. Natta 2001, *Ap. J.* **561**, 1074.
- [107] “Photodissociation of Peroxynitric Acid in the Near-IR” C.M. Roehl, S.A. Nizkorodov, H. Zhang, G.A. Blake, & P.O. Wennberg 2002, *J. Phys. Chem. A* **106**, 3766.
- [108] “ISO LWS Spectra of T Tauri & Herbig AeBe Stars in Taurus and Oph” M.J. Creech-Eakman, E.I. Chiang, E.F. van Dishoeck, & G.A. Blake 2002, *Astron. Ap.* **385**, 546.
- [109] “High Resolution $4.7\ \mu\text{m}$ Keck/NIRSPEC Spectra of Protostars. I: Ices and Infalling Gas in the Disk of L1489 IRS” Adwin C.A. Boogert, M.R. Hogerheijde, & Geoffrey A. Blake 2002, *Ap. J.* **568**, 761.
- [110] “The Environment & Nature of the Class I Protostar Elias 29: Molecular Gas Observations and the Location of Ices” A.C.A. Boogert, M.R. Hogerheijde, C. Ceccarelli, A.G.G.M. Tielens, E.F. van Dishoeck, G.A. Blake, W.B. Latter, & F. Motte 2002, *Ap. J.* **570**, 708.
- [111] “A Tidally Interacting Disk in the Young Triple System WL20?” M. Barsony, T.P. Greene, & Geoffrey A. Blake 2002, *Ap. J.(Letters)* **572**, L75.
- [112] “Looking for Pure Rotational H_2 Emission from Protoplanetary Disks” M.J. Richter, D.T. Jaffe, Geoffrey A. Blake, & J.H. Lacy 2002, *Ap. J.(Letters)* **572**, L161.

- [113] “Does IRAS 16293-2422 Have a Hot Core? Chemical Inventory and Abundance Changes in its Protostellar Environment” F.L. Schöier, J.K. Jørgensen, E.F. van Dishoeck, & Geoffrey A. Blake 2002, *Astron. Ap.* **390**, 1001.
- [114] “High Resolution 4.7 μm Keck/NIRSPEC Spectra of Protostars. II: Detection of the ^{13}CO Isotope in Icy Grain Mantles” A.C.A. Boogert, Geoffrey A. Blake, & A.G.G.M. Tielens 2002, *Ap. J.* **577**, 271.
- [115] “Millimeter-wave Searches for Cold Dust and Molecular Gas around T Tauri Stars in MBM 12” Michiel R. Hogerheijde, Ray Jayawardhana, Doug Johnstone, Geoffrey A. Blake & Jacqueline E. Kessler 2002, *Astron. J.* **124**, 3387.
- [116] “Millimeter Wavelength Measurements of the Rotational Spectrum of 2-Aminoethanol” Susanna Widicus, Brian J. Drouin, Kathryn A. Dyl, & Geoffrey A. Blake 2003, *J. Mol. Spec.* **217**, 278.
- [117] “Interferometric Observations of Formaldehyde in the Protoplanetary Disk around LkCa15” Yuri Aikawa, Munetake Momose, Wing-Fai Thi, Gerd-Jan van Zadelhoff, Chunhua Qi, Geoffrey A. Blake, & Ewine F. van Dishoeck 2003, *P.A.S.J.* **55**, 11.
- [118] “A Born-Oppenheimer Photolysis Model and its Application to N_2O Isotopic Fractionation” Geoffrey A. Blake, M.C. Liang, C.G. Morgan, & Yuk L. Yung 2003, *Geophys. Res. Lett.* **30(12)**, 1656.
- [119] “Observations of Rotationally Resolved C_3 in Translucent Sight Lines” Máté Ádámkóvics, Geoffrey A. Blake, & Benjamin J. McCall 2003, *Ap. J.* **595**, 235.
- [120] “From Molecular Cores to Planet-Forming disks: An SIRTf Legacy Program,” N. J. Evans, L.E. Allen, G.A. Blake et al. 2003 (18 authors), *Pub. Astron. Soc. Pac.* **115**, 965.
- [121] “A Theoretical Study of the Conversion of Gas Phase Methanediol to Formaldehyde” David R. Kent IV, Susanna L. Widicus, Geoffrey A. Blake, & William A. Goddard III 2003, *J. Chem. Phys.* **119**, 5117.
- [122] “ $^{14}\text{NH}_3$ & PH_3 Line Parameters: The 2000 HITRAN Update and New Results” I. Kleiner, G. Tarrago, C. Cottaz et al. 2003 (16 authors), *J. Quant. Spec. Rad. Trans.* **82**, 293.
- [123] “Continuum and CO/HCO^+ Emission from the Disk Around the T Tauri Star LkCa 15” Chunhua Qi, Jacqueline E. Kessler, David W. Koerner, Anneila I. Sargent, & Geoffrey A. Blake 2003, *Ap. J.* **597**, 986.
- [124] “The Structure of the NGC 1333-IRAS2 Protostellar System on 500 AU Scales – An Infalling Envelope, a Circumstellar Disk, Multiple Outflows, and Chemistry” J.K. Jørgensen, M.R. Hogerheijde, E.F. van Dishoeck, Geoffrey A. Blake, & F. L. Schöier 2004, *Astron. Ap.* **413**, 993.
- [125] “Isotopic Fractionation of Nitrous Oxide in the Stratosphere: Comparison between Model and Observations” C.G. Morgan, M. Allen, M.C. Liang, R.L. Shia, G.A. Blake, & Y.L. Yung 2004, *J. Geophys. Res.* **109**, D04305.
- [126] “The Impact of Shocks on the Chemistry of Molecular Clouds: High Resolution Images of Chemical Differentiation Along the NGC 1333-IRAS2A Outflow” J.K. Jørgensen, M.R. Hogerheijde, G.A. Blake, E.F. van Dishoeck, L.G. Mundy, & F. L. Schöier 2004, *Astron. Ap.* **415**, 1021.
- [127] “The Millimeter and Submillimeter Rotational Spectrum of 1,3-Dihydroxyacetone” Susanna L. Widicus, Rogier Braakman, David R. Kent, & Geoffrey A. Blake 2004, *J. Mol. Spec.* **224**, 101.

- [128] “High Resolution 4.7 μm Keck/NIRSPEC Spectroscopy of the CO Emission from the Disks surrounding Herbig Ae stars” Geoffrey A. Blake & Adwin C.A. Boogert 2004, *Ap. J.(Letters)* **606**, L73.
- [129] “On the Origin of the H₂CO Abundance Enhancements in Low Mass Protostars” F. L. Schöier, J.K. Jørgensen, E.F. van Dishoeck, & G.A. Blake 2004, *Astron. Ap.* **418**, 185.
- [130] “Combined BIMA and OVRO Observations of Comet C/1999 S4 (LINEAR)” Michiel R. Hogerheijde, I. de Pater, M. Wright et al. 2004 (15 authors), *Astron. J.* **127**, 2406.
- [131] “A Semi-Analytic Model for Photo-Induced Isotopic Fractionation in Simple Molecules” M.-C. Liang, Geoffrey A. Blake, & Yuk L. Yung 2004, *J. Geophys. Res. A* **109**, D10308.
- [132] “Spitzer Space Telescope Spectroscopy of Ices Toward Low Mass Embedded Protostars” Adwin C.A. Boogert, Klaus M. Pontoppidan, F. Lahuis et al. 2004 (26 authors), *Ap. J. Suppl.* **154**, 359.
- [133] “A “Starless” Core that Isn’t: Detection of a Source in the L1014 Dense Core with the Spitzer Space Telescope” C.H. Young, T.Y. Brooke, A. Crapsi et al. 2004 (29 authors), *Ap. J. Suppl.* **154**, 396.
- [134] “Evidence for O-Atom Exchange in the O(¹D) + N₂O Reaction as the Source of the Isotopic Fractionation in Atmospheric N₂O” Yuk L. Yung, Mao-Chang Liang, Geoffrey A. Blake, Richard P. Muller, & Charles E. Miller 2004, *Geophys. Res. Lett.* **31**, no. 10.1029/2004GL020950; see also, Yung, Y.L., Liang, M.C., Blake G.A., et al., *Geophys. Res. Lett.* **32**, Art. No. L11808.
- [135] “Methane Abundance Variations toward the Massive Protostar NGC 7538:IRS 9” A.C.A. Boogert, Geoffrey A. Blake, & Karin Öberg 2004, *Ap. J.* **615**, 344.
- [136] “Imaging the Disk around TW Hya with the Submillimeter Array” Chunhua Qi, P. Ho, D.J. Wilner et al. 2004 (13 authors), *Ap. J.(Letters)* **616**, L7.
- [137] “8–13 μm spectroscopy of YSOs: Evolution of the silicate feature” J.E. Kessler-Silacci, L.A. Hillenbrand, Geoffrey A. Blake, & M.R. Meyer 2005, *Ap. J.* **622**, 404.
- [138] “Ices in the Edge-on Disk CRBR 2422.8-3423: Spitzer Spectroscopy and Monte Carlo Radiative Transfer Modeling” K.M. Pontoppidan, C.P. Dullemond, E.F. van Dishoeck, G.A. Blake, A. Boogert, N.J. Evans, J. Kessler-Silacci, & F. Lahuis 2005, *Ap. J.* **622**, 463.
- [139] “1,3-Dihydroxyacetone in Sagittarius B2(N-LMH): The First Interstellar Ketose” Susanna L. Widicus-Weaver & Geoffrey A. Blake 2005, *Ap. J.(Letters)* **624**, L33.
- [140] “Diffuse Interstellar Bands Toward HD 62542” Máté Ádámkóvics, Geoffrey A. Blake, & Benjamin J. McCall 2005, *Ap. J.* **625**, 857.
- [141] “Mm-wave & Vibrational State Assignments for the Rotational Spectrum of Glycoaldehyde” Susanna L. Widicus-Weaver, R.A. Bulter, Brian J. Drouin, D.T. Petkie, Kathryn A. Dyl, Frank C. De Lucia, & Geoffrey A. Blake 2005, *Ap. J. Suppl. Ser.* **158**, 188.
- [142] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds. I. Cha II Observed with MIPS” K.E. Young, P.M. Harvey, T.Y. Brooke et al. 2005 (23 authors), *Ap. J.* **628**, 283.
- [143] “Aminomethanol Water Elimination: A Theoretical Examination” Michael T. Feldmann, Susanna L. Widicus, David R. Kent, Geoffrey A. Blake, & William A. Goddard 2005, *J. Chem. Phys.* **123**, Art. No. 034304.
- [144] “BIMA Array Detections of HCN in Comets LINEAR(C/2002 T7) & NEAT(C/2001 Q4)” D.N. Friedl, A. Remijan, L.E. Snyder et al. 2005 (13 authors), *Ap. J.(Letters)* **630**, 623.

- [145] “Deep Impact: Observations from a Worldwide Earth-Based Campaign ” K.J. Meech et al. (209 co-authors, including G. Blake) 2005, *Science* **310**, 265.
- [146] “Direct Measurement of Parent Volatiles in Comet 9P/Tempel 1: A Comparison of Volatile Composition Before and After Impact” M.J. Mumma, M.A. DiSanti, K. Magee-Sauer et al. 2005 (14 authors), *Science* **310**, 270.
- [147] “Protostellar Holes: Spitzer Space Telescope Observations of the Protostellar Binary IRAS 16293-2422” Jes K. Jørgensen, Fred Lahuis, Fredrik Schöier, Ewine F. van Dishoeck, Geoffrey A. Blake, A.C. Adwin Boogert, C.P. Dullemond, Neal J. Evans II, Jacqueline E. Kessler-Silacci, & Klaus M. Pontoppidan 2005, *Ap. J.(Letters)* **631**, L77.
- [148] “Spitzer Mid-Infrared Spectroscopy of Ices Toward Background Stars” Claudia Knez, A.C. Adwin Boogert, Klaus M. Pontoppidan, Jacqueline Kessler-Silacci, Neal J. Evans, II, Ewine F. van Dishoeck, Jean-Charles Augereau, Geoffrey A. Blake, & Fred Lahuis 2006, *Ap. J.(Letters)* **635**, L145.
- [149] “Hot organic chemistry in the inner part of protoplanetary disks” Fred Lahuis, A.C. Adwin Boogert, Ewine F. van Dishoeck, Klaus M. Pontoppidan, Geoffrey A. Blake, Cornelius P. Dullemond, Neal J. Evans II, Michiel R. Hogerheijde, Jes K. Jørgensen, Jacqueline E. Kessler-Silacci, & Claudia Knez 2006, *Ap. J.(Letters)* **636**, L145.
- [150] “CO J=6–5 Observations of TW Hya with the Submillimeter Array” Chunhua Qi, David J. Wilner, Nuria Calvet, Tyler L. Bourke, Geoffrey A. Blake, Michiel Hogerheijde, Paul T.P. Ho, & Edwin Bergin 2006, *Ap. J.(Letters)* **636**, L157.
- [151] “Measurements of $^{14}\text{NH}_3$ in the $\nu_2=1$ state by a solid-state, photomixing, THz spectrometer, and a simultaneous analysis of the microwave, THz, and infrared transitions between the ground and ν_2 inversion-rotation levels” Pin Chen, Herbert M. Pickett, Shuji Matsuura, & Geoffrey A. Blake 2006, *J. Mol. Spec.* **236**, 116.
- [152] “C2D Spitzer-IRS Spectra of Disks Around T Tauri Stars: I. Silicate Emission and Grain Growth” Jacqueline E. Kessler-Silacci, Jean-Charles Augereau, Cornelius P. Dullemond et al. 2006 (13 authors), *Ap. J.* **639**, 275.
- [153] “Isotopic Composition of Stratospheric Ozone” Mao-Chang Liang, Fredrick W. Irion, Jason D. Weibel, Charles E. Miller, Geoffrey A. Blake, & Yuk L. Yung 2006, *J. Geophys. Res.* **111**, D02302, doi:10.1029/2005JD006342.
- [154] “A BIMA Array Survey of Molecules in Comets Linear(C/2002 T7) & Neat(C/2001 Q4)” Anthony J. Remijan, D.N. Friedel, I. de Pater et al. 2006 (13 authors), *Ap. J.* **643**, 567.
- [155] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds. II. Serpens Observed with IRAC” Paul M. Harvey, N. Chapman, S.-P. Lai et al. 2006 (19 authors), *Ap. J.* **644**, 307.
- [156] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds. III. Perseus Observed with IRAC” Jes K. Jørgensen, Paul M. Harvey, Neal J. Evans II et al. 2006 (22 authors), *Ap. J.* **645**, 1246.
- [157] “Weak-line T Tauri Star Disks I. Initial Spitzer Results from the c2d Legacy Project” Deborah L. Padgett, L. Cieza, K.R. Stapelfeldt et al. 2006 (21 authors), *Ap. J.* **645**, 1283.
- [158] “The Volatile Composition of the Split Ecliptic Comet 73P/Schwassman-Wachmann 3: A Comparison of Fragments C and B” Geronimo L. Villanueva, Boncho P. Bonev, Karen Magee-Sauer, Michael A. DiSanti, Colette Salyk, Geoffrey A. Blake, & Michael J. Mumma 2006, *Ap. J.(Letters)* **650**, L87.

- [159] “Oxygen Isotopic Composition of Carbon Dioxide in the Middle Atmosphere” Mao-Chang Liang, Geoffrey A. Blake, Brenton R. Lewis, & Yuk L. Yung 2007, *P.N.A.S.* **104**, 21.
- [160] “Methane and Ethane on the Bright Kuiper Belt Object 2005 FY9” M.E. Brown, K.M. Barkume, G.A. Blake, E.L. Schaller, D.L. Rabinowitz, H.G. Roe, & C.A. Trujillo 2007, *Astron. J.* **133**, 284.
- [161] “C2D Spitzer-IRS Spectra of Disks Around T Tauri Stars: II. PAH Emission Features” Vincent Geers, Jean-Charles Augereau, Klaus M. Pontoppidan et al. 2007 (13 authors), *Astron. Ap.* **459**, 545.
- [162] “Molecular Gas in the Inner 1 AU of the TW Hya/GM Aur Transitional Disks” Colette Salyk, Geoffrey A. Blake, A.C.A. Boogert, & Joanna M. Brown 2007, *Ap. J.* **655**, L105.
- [163] “The Spitzer c2d Survey of Nearby Dense Cores. IV. Revealing the Embedded Cluster in B59” Timothy Y. Brooke, Tracy L. Huard, Tyler L. Bourke et al. 2007 (25 authors), *Ap. J.* **655**, 364.
- [164] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds. V. Chamaeleon II Observed with IRAC” Alicia Porras, Jes K. Jørgensen, Lori E. Allen et al. 2007 (22 authors), *Ap. J.* **656**, 493.
- [165] “Modeling Spitzer Observations of VV Ser I. The Circumstellar Disk of a UX Orionis Star” Klaus M. Pontoppidan, Cornelius P. Dullemond, Geoffrey A. Blake, A.C. Adwin Boogert, E.F. van Dishoeck, N.J. Evans II, J. Kessler-Silacci, & F. Lahuis 2007, *Ap. J.* **656**, 980.
- [166] “Modeling Spitzer Observations of VV Ser. II. An Extended Quantum Heated Nebula and a Disk Shadow” Klaus M. Pontoppidan, Cornelius P. Dullemond, Geoffrey A. Blake, N.J. Evans II, V.C. Geers, P.M. Harvey, & W. Spiesman 2007, *Ap. J.* **656**, 991.
- [167] “Deep Spitzer Spectroscopy of the ‘Flying Saucer’ Edge-on Disk: Large Grains beyond 50 AU” Klaus M. Pontoppidan, Karl M. Stapelfeldt, Geoffrey A. Blake, Ewine F. van Dishoeck, & Cornelius P. Dullemond 2007, *Ap. J.(Letters)* **658**, L111.
- [168] “Probing Protoplanetary Disks with Silicate Emission: Where is the Silicate Emission Zone?” Jacqueline E. Kessler-Silacci, Cornelius P. Dullemond, Jean-Charles Augereau, Vincent Geers, Ewine F. van Dishoeck, Neal J. Evans II, Geoffrey A. Blake, & Joanna M. Brown 2007, *Ap. J.* **659**, 680.
- [169] “TEXES Observations of Pure Rotational H₂ Emission from AB Aurigae” Martin A. Bitner, Matthew J. Richter, John H. Lacy, Thomas K. Greathouse, Daniel T. Jaffe, & Geoffrey A. Blake 2007, *Ap. J.(Letters)* **661**, L69.
- [170] “Abundant Crystalline Silicates in the Disk of a Very Low Mass Star” Bruno Merín, Jean-Charles Augereau, Fred Lahuis et al. 2007 (20 authors), *Ap. J.* **661**, 361.
- [171] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds VIII. Serpens Observed with MIPS” Paul M. Harvey, Luisa M. Rebull, Tim Brooke et al. 2007 (18 authors), *Ap. J.* **663**, 1139.
- [172] “Cold Disks: Spitzer Spectroscopy of Disks around Young Stars with Large Gaps” Joanna M. Brown, Geoffrey A. Blake, Cornelius P. Dullemond et al. 2007 (12 authors), *Ap. J.(Letters)* **664**, L107.
- [173] “c2d Spitzer IRS Spectra of Disks around T Tauri Stars. III. [Ne II], [Fe I], and H₂ Gas-Phase Lines” Fred Lahuis, Ewine F. van Dishoeck, Geoffrey A. Blake, Neal J. Evans II, Jacqueline E. Kessler-Silacci, & Klaus M. Pontoppidan 2007, *Ap. J.* **665**, 492.

- [174] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds: VI. Perseus Observed with MIPS” L. M. Rebull, K. R. Stapelfeldt, N. J. Evans II et al. 2007 (24 authors), *Ap. J. Suppl.* **171**, 447.
- [175] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds. IV. Lupus Observed with MIPS” N.L. Chapman, S.-P. Lai, L.G. Mundy et al. 2007 (25 authors), *Ap. J.* **667**, 288.
- [176] “The Spitzer c2d Survey of Weak-line T Tauri Stars II: New Constraints on the Timescale for Planet Building” Lucas Cieza, Deborah L. Padgett, Karl R. Stapelfeldt et al. 2007 (20 authors), *Ap. J.* **667**, 308.
- [177] “The Detection and Characterization of cm Radio Continuum Emission from the Low-mass Protostar L1014-IRS” Yancy L. Shirley, Mark J. Claussen, Tyler M. Bourke, Chadwick H. Young, & Geoffrey A. Blake 2007, *Ap. J.* **667**, 329.
- [178] “The Spitzer c2d Survey of Large, Nearby, Interstellar Clouds VII. Ophiuchus Observed with MIPS” Deborah L. Padgett, L.M. Rebull, K.R. Stapelfeldt et al. 2008 (23 authors), *Ap. J.* **672**, 1013.
- [179] “LkH α 330: Evidence for Dust Clearing through Resolved Submillimeter Imaging” Joanna M. Brown, Geoffrey A. Blake, C. Qi, C.P. Dullemond, & David J. Wilner 2008, *Ap. J. (Letters)* **675**, L109.
- [180] “H₂O and OH Gas in the Terrestrial Planet-Forming Zones of Protoplanetary Disks” Colette Salyk, Klaus M. Pontoppidan, Geoffrey A. Blake, Fred Lahuis, Ewine F. van Dishoeck, & Neal J. Evans II 2008, *Ap. J. (Letters)* **676**, L49.
- [181] “The c2d Spitzer Spectroscopic Survey of Ices around Low-Mass Young Stellar Objects. I. H₂O and the 5-8 μ m Bands” A.C.A. Boogert, K.M. Pontoppidan, C. Knez et al. 2008 (26 authors), *Ap. J.* **678**, 985.
- [182] “The c2d Spitzer Spectroscopic Survey of Ices around Low-Mass Young Stellar Objects II: CO₂” Klaus M. Pontoppidan, Adwin C. A. Boogert, Helen J. Fraser, Ewine F. van Dishoeck, Geoffrey A. Blake, F. Lahuis, Karin I. Oeberg, Neal J. Evans II, & Colette Salyk 2008, *Ap. J.* **678**, 1005.
- [183] “The c2d Spitzer Spectroscopic Survey of Ices around Low-Mass Young Stellar Objects III: CH₄” Karin I. Oeberg, A.C. Adwin Boogert, Klaus M. Pontoppidan, Geoffrey A. Blake, Neal J. Evans II, Fred Lauis, & Ewine F. van Dishoeck 2008, *Ap. J.* **678**, 1032.
- [184] “The Seasonal cycle of C¹⁶O¹⁶O, C¹⁶O¹⁷O, and C¹⁶O¹⁸O in the middle atmosphere: Implications for mesospheric dynamics and biogeochemical sources and sinks of CO₂” Mao-Chang Liang, Geoffrey A. Blake, Geoffrey A. & Yuk L. Yung, Yuk L. 2008, *J. Geophys. Res.* **113**, Issue D12, DOI 10.1029/2007JD008392.
- [185] “Resolving the Chemistry in the Disk of TW Hydrae I. Deuterated Species” Chunhua Qi, David J. Wilner, Geoffrey A. Blake, & Michiel R. Hogerheijde 2008, *Ap. J.* **681**, 1396.
- [186] “Discovery of OH in Circumstellar Disks Around Young Intermediate Mass Stars” Avi M. Mandell, Michael J. Mumma, Geoffrey A. Blake, Boncho P. Bonev, Geronimo L. Villanueva, & Colette Salyk 2008, *Ap. J. (Letters)* **681**, L25.
- [187] “Spectro-astrometric Imaging of Molecular Gas within Protoplanetary Disk Gaps” Klaus M. Pontoppidan, Geoffrey A. Blake, Ewine F. van Dishoeck, Alain Smette, Michael I. Ireland, & Joanna Brown 2008, *Ap. J.* **684**, 1323.

- [188] “Torsion-Rotation Global Analysis of the First Three Torsional States ($\nu_t = 0, 1, 2$) and THz Database for Methanol” Xu, Li-Hong, Fisher, J., Lees, R.M., Shi, H.Y., Hougen, J.T., Pearson, J.C., Drouin, B.J., Blake, G. A., Braakman, R. 2008, *J. Mol. Spec.* **251**, 305.
- [189] “Probing Dust Grain Evolution in IM Lupi’s Circumstellar Disk. Multi-wavelength Observations and Modeling of the Dust Disk” C. Pinte, D.L. Padgett, F. Menard et al. 2008 (22 authors), *Astron. Ap.* **489**, 633.
- [190] “Captured at Millimeter Wavelengths: A Flare from the Classical T Tauri Star DQ Tau” D. Salter, M.R. Hogerheijde, & G.A. Blake 2008, *Astron. Ap.* **492**, L21.
- [191] “The TEXES Survey for H₂ Emission from Protoplanetary Disks” Martin A. Bitner, Matthew J. Richter, John H. Lacy et al. 2008 (12 authors), *Ap. J.* **688**, 1326.
- [192] “Lack of PAH Emission toward Low-Mass Embedded Young Stellar Objects” Vincent C. Geers, Ewine F. van Dishoeck, Klaus M. Pontoppidan, F. Lahuis, A. Crapsi, C. P. Dullemond, & Geoffrey A. Blake 2009, *Astron. Ap.* **495**, 837.
- [193] “The Spitzer c2d Legacy Results: Star Formation Rates and Efficiencies; Evolution and Lifetimes” Neal J. Evans II, M.M. Dunham, J.K. Jørgensen et al. 2009 (18 authors), *Ap. J. Suppl. Ser.* **181**, 321.
- [194] “High Resolution Spectroscopy of [Ne II] Emission from AA Tau and GM Aur” Joan R. Najita, Greg W. Doppmann, Martin A. Bitner, Matthew J. Richter, John H. Lacy, Daniel T. Jaffe, John S. Carr, Rowin Meijerink, Geoffrey A. Blake, Gregory J. Herczeg, & Alfred E. Glassgold 2009, *Ap. J.* **697**, 957.
- [195] “Simultaneous Observations of Comet C/2002 T7 (LINEAR) with the BIMA and OVRO Interferometers: HCN and CH₃OH” Michiel R. Hogerheijde, Chunhua Qi, Imke de Pater, Geoffrey A. Blake, D.N. Friedl, J.R. Forster, Patrick Palmer, Anthony J. Remijan, L.E. Snyder, & M.C.H. Wright 2009, *Astron. J.* **137**, 4837.
- [196] “The Evolution of Massive YSOs in the LMC: Part I. Identification and Spectral Classification” Jonathan P. Seale, Leslie W. Looney, Y.-H. Chu, R.A. Gruendl, B. Brandl, C.-H. Chen, W. Brandner, & Geoffrey A. Blake 2009, *Ap. J.* **699**, 150.
- [197] “High Resolution 5 μ m Spectroscopy of Transitional Disks” Colette V. Salyk, Geoffrey A. Blake, Adwin C.A. Boogert, & Joanna M. Brown 2009, *Ap. J.* **699**, 330.
- [198] “C2D IRS spectra of disks around T Tauri stars IV. Crystalline silicates” J. Olofsson, J.C. Augereau, E.F. van Dishoeck et al. 2009 (16 authors), *Astron. Ap.* **507**, 327.
- [199] “Evidence for dust clearing through resolved submillimeter imaging” J.M. Brown, Geoffrey A. Blake, C. Qi, C.P. Dullemond, D.J. Wilner, & J.P. Williams 2009, *Ap. J.* **704**, 496.
- [200] “Radiative Transfer Models of Mid-Infrared H₂O Lines in the Planet-Forming Region of Circumstellar Disks” R. Meijerink, K.M. Pontoppidan, Geoffrey A. Blake, D.R. Poelman, & C.P. Dullemond 2009, *Ap. J.* **704**, 1471.
- [201] “A New Raytracer for Modeling AU-Scale Imaging of Lines from Protoplanetary Disks” Klaus M. Pontoppidan, Rowin Meijerink, Cornelis P. Dullemond & Geoffrey A. Blake 2009, *Ap. J.* **704**, 1482.
- [202] “Grain growth across protoplanetary discs: 10 μ m silicate feature versus millimetre slope” Dave J.P. Lommen, Ewine F. van Dishoeck, Chris M. Wright, Sarah T. Maddison, Michiel Min, David J. Wilner, Demerese M. Salter, Huib Jan van Langevelde, Tyler L. Bourke, Remco F.J. van der Burg & Geoffrey A. Blake 2010, *Astron. Ap.* **515**, A77

- [203] “Herschel-PACS Spectroscopy of the Intermediate Mass Protostar NGC7129 FIRS 2” M. Fich, D. Johnstone, T.A. van Kempen et al. 2010 (61 authors), *Astron. Ap.* **518**, L86.
- [204] “Water abundance variations around high-mass protostars: HIFI Observations of the DR21 region” F.F.S. van der Tak, M.G. Marseille, F. Herpin et al. 2010 (64 authors), *Astron. Ap.* **518**, L107.
- [205] “Herschel observations of extra-ordinary sources: Detection of HF in absorption towards Orion KL” T.G. Phillips, E.A. Bergin, D. C. Lis et al. 2010 (54 authors), *Astron. Ap.* **518**, L109.
- [206] “Detection of Interstellar Oxidaniumyl: Abundant H_2O^+ towards the Star-Forming Regions DR21, Sgr B2 and NGC6334” V. Ossenkopf, H.S.P. Müller, D.C. Lis, P. Schilke, T.A. Bell et al. 2010 (102 authors), *Astron. Ap.* **518**, L111.
- [207] “The CHESSE Spectral Survey of Star Forming Regions: Peering into the Protostellar Shock L1157-B1. I. Shock Chemical Complexity” C. Codella, B., Lefloch, C. Ceccarelli et al. 2010 (64 authors), *Astron. Ap.* **518**, L112.
- [208] “The CHESSE Spectral Survey of Star Forming Regions: Peering into the Protostellar Shock L1157-B1. II. Dynamics” B. Lefloch, S. Cabrit, G. Melnick et al. 2010, (71 authors), *Astron. Ap.* **518**, L113.
- [209] “Water Cooling of Shocks in Protostellar Outflows: A Herschel-PACS Map of L1157” B. Nisini, M. Benedettini, C. Codella et al. 2010 (66 authors), *Astron. Ap.* **518**, L120.
- [210] “Origin of the Hot Gas in Low-Mass Protostars. Herschel-PACS Spectroscopy of HH 46” T.A. van Kempen, L.E. Kristensen, G.J. Herczeg et al. 2010 (66 authors), *Astron. Ap.* **518**, L121.
- [211] “Dust, Ice and Gas in Time (DIGIT) Herschel Program First Results: A Full PACS-SED Scan of the gas line emission in Protostar DK Cha” T.A. van Kempen, J.D. Green, N.J. Evans et al. 2010 (45 authors), *Astron. Ap.* **518**, L128.
- [212] “The Dust, Ice and Gas in Time Herschel Key Program First Results: Dust and Gas Spectroscopy of HD100546” B. Sturm, J. Bouwman, Th. Henning, N.J. Evans et al. 2010 (45 authors), *Astron. Ap.* **518**, L129.
- [213] “A Study of the Distant Activity of Comet C/2006 W3 (Christensen) using Herschel and Ground-based Radio Telescopes” D. Bockelée-Morvan, P. Hartogh, J. Crovisier, B. Vandenbussche et al. 2010 (39 authors), *Astron. Ap.* **518**, L149.
- [214] “HIFI Observations of Water in the Atmosphere of Comet C/2008 Q3 (Garradd)” P. Hartogh, J. Crovisier, M. de Val-Borro, D. Bockelée-Morvan et al. 2010 (46 authors), *Astron. Ap.* **518**, L150.
- [215] “The Herschel-SPIRE submillimetre spectrum of Mars” B.M. Swinyard, P. Hartogh, S. Sidher et al. (2010) (47 authors), *Astron. Ap.* **518**, L151.
- [216] “First Results of Herschel/PACS Observations of Neptune” E. Lellouch, P. Hartogh, H. Feuchtgruber et al. 2010 (54 authors), *Astron. Ap.* **518**, L152.
- [217] “The c2d Spitzer spectroscopic survey of ices around low-mass young stellar objects. IV. NH_3 and CH_3OH ” Sandrine Bottinelli, A. C. Adwin Boogert, J. Bouwman, Martha Beckwith, Ewine F. van Dishoeck, Karin I. Oberg, Klaus M. Pontoppidan, Harold Linnartz, Geoffrey A. Blake, Neal J. Evans & Fred Lahuis 2010, *Ap. J.* **718**, 1100.

- [218] “A Spitzer c2d Legacy Survey to Identify and Characterize Disks with Inner Dust Holes” Bruno Merin, Joanna M. Brown, Isa Oliveira et al. 2010 (21 authors), *Ap. J.* **718**, 1200.
- [219] “The Millimeter-Wave Spectrum of Methoxyacetonitrile” Rogier Braakman & Geoffrey A. Blake 2010, *J. Mol. Spec.* **262**, 93.
- [220] “The Millimeter-Wave Spectrum of 2-Cyanoethanol” Rogier Braakman & Geoffrey A. Blake 2010, *J. Mol. Spec.* **262**, 100.
- [221] “A Spitzer Survey of Mid-Infrared Molecular Emission from Protoplanetary Disks I: Detection Rates” Klaus M. Pontoppidan, Colette Salyk, Geoffrey A. Blake, Rowin Meijerink, John Carr & Joan Najita 2010, *Ap. J.* **720**, 887.
- [222] “c2d Spitzer IRS Spectra of Embedded Protostars: Gas-phase Lines” Fred Lahuis, Ewine F. van Dishoeck, Jes K. Jørgensen, Geoffrey A. Blake, & Neal J. Evans 2010, *Astron. Ap.* **519**, A3.
- [223] “C2D Spitzer-IRS spectra of disks around T Tauri stars V. Spectral decomposition” J. Olofsson, J.-C. Augereau, E.F. van Dishoeck, B. Merín, N. Grosso, F. Menard, G.A. Blake, & J.-L. Monin 2010, *Astron. Ap.* **520**, A39.
- [224] “Recurring millimeter flares as evidence for star-star magnetic reconnection events in the DQ Tau PMS binary system” D.M. Salter, Á. Kóspál, K.V. Getman, M.R. Hogerheijde, T.A. van Kempen, J.M. Carpenter, G.A. Blake, & D. Wilner 2010, *Astron. Ap.* **521**, A32.
- [225] “Herschel/HIFI Discovery of Interstellar Chloronium (H_2Cl^+)” D.C. Lis, J.C. Pearson, D.A. Neufeld, P. Schilke et al. 2010 (103 authors), *Astron. Ap.* **521**, L9.
- [226] “Herschel observations of ortho- and para-oxidaniumyl (H_2O^+) in spiral arm clouds toward Sgr B2(M)” P. Schilke, C. Comito, H.S.P. Mueller et al. 2010 (58 authors), *Astron. Ap.* **521**, L11.
- [227] “Herschel observations of EXtra-Ordinary Sources: Detecting spiral arm clouds by CH absorption lines” S.-L. Qin, P. Schilke, C. Comito et al. 2010 (70 authors), *Astron. Ap.* **521**, L14.
- [228] “Herschel observations of EXtra-Ordinary Sources: the present and future of spectral surveys with Herschel/HIFI” E.A. Bergin, T.G. Phillips, C. Comito et al. 2010 (59 authors), *Astron. Ap.* **521**, L20.
- [229] “Herschel observations of EXtra-Ordinary Sources: The Terahertz spectrum of Orion KL seen at high spectral resolution” N.R. Crockett, E.A. Bergin, S. Wang et al. 2010 (63 authors), *Astron. Ap.* **521**, L21.
- [230] “Herschel Spectral Surveys of Star Forming Regions – Overview of the 555-636 GHz Range” C. Ceccarelli, A. Bacmann, A. Boogert et al. 2010 (66 authors), *Astron. Ap.* **521**, L22.
- [231] “Herschel/HIFI measurements of the ortho/para ratio in water towards Sagittarius B2(M) and W31C” D.C. Lis, T.G. Phillips, P.F. Goldsmith et al. 2010 (77 authors), *Astron. Ap.* **521**, L26.
- [232] “Herschel observations of EXtra-Ordinary sources: Detection of H_2O and its isotopologues towards Orion KL” G.J. Melnick, V. Tolls, D.A. Neufeld et al. 2010 (49 authors), *Astron. Ap.* **521**, L27.
- [233] “The distribution of water in the high-mass star-forming region NGC 6334F” M. Eprechtinger, D. C. Lis, T. Bell et al. 2010 (69 authors), *Astron. Ap.* **521**, L28.

- [234] “Water vapor toward starless cores: the Herschel view” P.Caselli, E.Keto, L. Pagani et al. 2010 (66 authors), *Astron. Ap.* **521**, L29.
- [235] “Water in low-mass star-forming regions with Herschel: HIFI spectroscopy of NGC1333” L.E. Kristensen, R. Visser, E.F. van Dishoeck et al. 2010 (67 authors), *Astron. Ap.* **521**, L30.
- [236] “Ortho-to-para ratio of interstellar heavy water” C. Vastel, C. Ceccarelli, E. Caux et al. 2010 (68 authors), *Astron. Ap.* **521**, L31.
- [237] “Water Abundances in High Mass Protostellar Envelopes: Herschel Observations with HIFI” M.G. Marseille, F.F.S. van der Tak, F. Herpin et al. 2010 (71 authors), *Astron. Ap.* **521**, L32.
- [238] “Sensitive limits on the abundance of cold water vapor in the DM Tau protoplanetary disk” E. Bergin, M.R. Hogerheijde, C. Brinch et al. 2010 (64 authors), *Astron. Ap.* **521**, L33.
- [239] “Variations in $\text{H}_2\text{O}^+/\text{H}_2\text{O}$ ratios toward massive star-forming regions” F. Wyrowski, F. van der Tak, F. Herpin et al. 2010 (66 authors), *Astron. Ap.* **521**, L34.
- [240] “Hydrides in Young Stellar Objects: Radiation tracers in a protostar-disk-outflow system” A.O. Benz, S. Bruderer, E.F. van Dishoeck et al. 2010 (69 authors), *Astron. Ap.* **521**, L35.
- [241] “Herschel observations of the hydroxyl radical (OH) in young stellar objects” S.F. Wampfler, G.J. Herczeg, S. Bruderer et al. 2010 (61 authors), *Astron. Ap.* **521**, L36.
- [242] “Water in massive star-forming regions: HIFI observations of W3 IRS5” L. Chavarria, F. Herpin, T. Jacq et al. 2010 (61 authors), *Astron. Ap.* **521**, L37.
- [243] “Herschel observations of deuterated water towards Sgr B2(M)” C. Comito, P. Schilke, R. Rolffs et al. 2010 (56 authors), *Astron. Ap.* **521**, L38.
- [244] “The methanol lines and hot core of OMC2-FIR4, an intermediate-mass protostar, with Herschel-HIFI” M. Kama, C. Dominik, S. Maret et al. 2010 (66 authors), *Astron. Ap.* **521**, L39.
- [245] “Herschel-HIFI observations of high-J CO lines in the NGC 1333 low-mass star-forming region” U.A. Yldz, E.F. van Dishoeck, L.E. Kristensen et al. 2010 (63 authors), *Astron. Ap.* **521**, L40.
- [246] “HERSCHEL-HIFI spectroscopy of the intermediate mass protostar NGC7129 FIRS2” D. Johnstone, M. Fich, C. McCoey et al. 2010 (61 authors), *Astron. Ap.* **521**, L41.
- [247] “First detection of ND in the solar-mass protostar IRAS16293-2422” A. Bacmann, E. Caux, P. Hily-Blant et al. 2010 (67 authors), *Astron. Ap.* **521**, L42.
- [248] “Herschel/HIFI observations of spectrally resolved methylidyne signatures toward the high-mass star-forming core NGC6334I” M.H.D. van der Wiel, F.F.S. van der Tak, D.C. Lis et al. 2010 (68 authors), *Astron. Ap.* **521**, L43.
- [249] “Herschel-HIFI detections of hydrides towards AFGL 2591. Envelope emission versus tenuous cloud absorption” S. Bruderer, A.O. Benz, E.F. van Dishoeck et al. 2010 (69 authors), *Astron. Ap.* **521**, L44.
- [250] “Reversal of infall in SgrB2(M) revealed by Herschel/HIFI observations of HCN lines at THz frequencies” R. Rolffs, P. Schilke, C. Comito et al. 2010 (57 authors), *Astron. Ap.* **521**, L46.

- [251] “Detection of OH⁺ and H₂O⁺ towards Orion KL” H. Gupta, P. Rimmer, J.C. Pearson et al. 2010 (75 authors), *Astron. Ap.* **521**, L47.
- [252] “First results on Martian carbon monoxide from Herschel/HIFI observations” P. Hartogh, M.I. Bocka, C. Jarchow et al. 2010 (51 authors), *Astron. Ap.* **521**, L48.
- [253] “Herschel/HIFI observations of Mars: first detection of O₂ at submillimetre wavelengths and upper limits on HCl and H₂O₂” P. Hartogh, C. Jarchow, E. Lellouch et al. 2010 (50 authors), *Astron. Ap.* **521**, L49.
- [254] “Water production in comet 81P/Wild 2 as determined by Herschel/HIFI” M. de Val-Borro, P. Hartogh, J. Crovisier et al. 2010 (45 authors), *Astron. Ap.* **521**, L50.
- [255] “Nitrogen hydrides in the cold envelope of IRAS 16293-2422” P. Hily-Blant, S. Maret, A. Bacmann, S. Bottinelli, B. Parise et al. 2010 (61 authors), *Astron. Ap.* **521**, L52.
- [256] “Spectrally resolved pure rotational lines of water in protoplanetary disks,” Klaus M. Pontoppidan, Geoffrey A. Blake, Colette Salyk & Hans Ulrich Käufl 2010, *Ap. J. (Letters)* **722**, L173.
- [257] “Organic compounds in the C₃H₆O₃ family: Microwave Spectrum of cis-cis-Dimethyl Carbonate” F.J. Lovas, D.F. Plusquellic, S.L. Widicus Weaver, B.A. McGuire, & G.A. Blake 2010, *J. Mol. Spec.* **264**, 10.
- [258] “Extended Analysis of Hydroxyacetone in the Torsional Ground State” Rogier Braakman, Brian J. Drouin, Susanna L. Widicus Weaver, & Geoffrey A. Blake 2010, *J. Mol. Spec.* **264**, 43 (cover article).
- [259] “The Spitzer c2d Survey of Weak-Line T Tauri Stars. III. The Transition from Primordial Disks to Debris Disks” Zahed Wahhaj, Lucas Cieza, Karl R. Stapelfeldt et al. 2010 (18 authors), *Ap. J.* **724**, 835.
- [260] “Search for Interstellar Methoxyacetonitrile and Cyanoethanol: Insights into Coupling of Cyano- to Methanol and Ammonia Chemistry” R. Braakman, G.A. Blake, A. Belloche, & K. Menten 2010, *Ap. J.* **724**, 994.
- [261] “Investigating the Cosmic Ray Ionization Rate Near the Supernova Remnant IC 443 through H₃⁺ Observations” Nick Indriolo, Geoffrey A. Blake, Miwa Goto, Tomonori Usuda, Takeshi Oka, T.R. Geballe, Brian D. Fields, & Benjamin J. McCall 2010, *Ap. J.* **724**, 1357.
- [262] “The Fundamental Vibrational Transition of CO During the Outburst of EX Lupi in 2008” M. Goto, Zs. Regály, C. P. Dullemond et al. 2011 (19 authors), *Ap. J.* **728**, 5.
- [263] “Non-Detection of L-band Line Emission from the Exo-Planet HD189733b” Avi Mandell, Drake Deming, Geoffrey A. Blake, Heather Knutson, & Michael Mumma 2011, *Ap. J.* **728**, 18.
- [264] “Water in Star-forming Regions with the Herschel Space Observatory (WISH). I. Overview of Key Program and First Results” E.F. van Dishoeck, L.E. Kristensen, A.O. Benz et al. 2011 (62 authors), *Pub. Astron. Soc. Pac.* **123**, 138.
- [265] “Herschel observations of Extra-Ordinary Sources: Methanol as a probe of physical conditions in Orion KL” S. Wang, E.A. Bergin, N. R. Crockett et al. 2011 (48 authors), *Astron. Ap.* **527**, A95.
- [266] “Hunting for Millimeter Flares from Magnetic Reconnection in Pre-Main Sequence Spectroscopic Binaries” A. Kóspál, D.M. Salter, M.R. Hogerheijde, A. Moór, & G.A. Blake 2011, *Astron. Ap.* **527**, A96.

- [267] “Ices and Dust in the Quiescent Medium of Isolated Dense Cores” A.C.A. Boogert, T. Huard, A. Cooke, J. Chiar, C. Knez, L. Decin, G.A. Blake, T. Brooke, J. Jørgensen, P. Myers, A. Tielens, & E.F. van Dishoeck 2011, *Ap. J.* **729**, 92.
- [268] “Warm dust resolved in the cold disk around T Chamaeleontis with VLTI/AMBER” J. Olofsson, Benisty, M., Augereau, J.-C., Pinte, C., Mnard, F., Tatulli, E., Berger, J.-P., Malbet, F., Mern, B., van Dishoeck, E.F., Lacour, S., Pontoppidan, K.M.; Monin, J.-L., Brown, J.M., & Blake, G.A. 2011, *Astron. Ap.* **528**, L6.
- [269] “Principles and Promise of Fabry-Perot Resonators at THz Frequencies” Rogier Braakman & Geoffrey A. Blake 2011, *J. Appl. Phys.* **109**, 063102.
- [270] “A Spitzer Survey of Mid-Infrared Molecular Emission from Protoplanetary Disks. II. Correlations and LTE Models” C. Salyk, K.M. Pontoppidan, G.A. Blake, J. Carr, & J. Najita 2011, *Ap. J.* **731**, 130.
- [271] “The Structure and Dynamics of Molecular Gas in Planet-Forming Zones: A CRIRES Spectro-Astrometry Survey” Klaus M. Pontoppidan, Geoffrey A. Blake, & Alain Smette 2011, *Ap. J.* **733**, 84.
- [272] “Temporal Variability and Spatial Aspects of Volatile Release from 103P/Hartley-2” M.J. Mumma, B.P. Bonev, G.L. Villanueva, M.A. DiSanti, L. Paganini, E.L. Gibb, J. Keane, G.A. Blake, R.S. Ellis, K. Magee-Sauer, M. Combi, H. Boehnhardt, M. Lippi & K. Meech 2011, *Ap. J. (Letters)* **734**, L7.
- [273] “Ocean-like Water in the Jupiter-Family Comet 103P/Hartley-2” P. Hartogh, D.C. Lis, D. Bockelée-Morvan, M. de Val-Borro, N. Biver, M. Küppers, M. Emprechtinger, E.A. Bergin, J. Crovisier, M. Rengel, R. Moreno, S. Szutowicz & G.A. Blake 2011, *Nature* **478**, 7367.
- [274] “The Spitzer ice legacy: Ice evolution from cores to protostars” Karin I. Öberg, A.C.A. Boogert, K.M. Pontoppidan, S. van den Broek, E.F. van Dishoeck, S. Bottinelli, G.A. Blake, & N.J. Evans 2011, *Ap. J.* **740**, 109.
- [275] “Detection of the Water Reservoir in a Forming Planetary System” M.R. Hogerheijde, A. E.E. Bergin, C. Brinch, I. Cleeves, J.K. Fogel, G.A. Blake, C. Dominik, D.C. Lis, G. Melnick, D. Neufeld, O. Paníć, J.C. Pearson, L. Kristensen, U. Yldz, & E.F. van Dishoeck 2011, *Science* **334**, 338.
- [276] “The molecular composition of Comet C/2007 W1 (Boattini): Evidence of a peculiar outgassing and a rich chemistry” G.L. Villanueva, Mumma, M.J., DiSanti, M.A., Bonev, B.P., Gibb, E.L., Magee-Sauer, K., Blake, G. A., & Salyk, C. 2011, *Icarus* **216**, 227.
- [277] “Wide-field optical sectioning for live-tissue imaging by plane-projection multi-photon microscopy” Jiun-Yann Yu, Chun-Hung Kuo, Daniel B. Holland, Yenyu Chen, Mingxing Ouyang, Geoffrey A. Blake, Ruben Zadoyan, & Chin-Lin Guo 2011, *J. Biomed. Optics* **16**, 116009; doi:10.1117/1.3647570.
- [278] “CO Rovibrational Emission as a Probe of Inner Disk Structure” C. Salyk, G.A. Blake, A.C.A. Boogert, J. Brown 2011, *Ap. J.*, in press.
- [279] “First Detection of the NIR Emission from Organic Molecules in T Tauri Stars” Avi M. Mandell, Jeanette Bast, Ewine F. van Dishoeck, Geoffrey A. Blake, Colette Salyk, Michael J. Mumma, & Geronimo Villanueva 2011, *Ap. J.*, submitted.

- [280] “A Deep, Broadband Spectral Line Survey of Orion KL at $\lambda=1.3$ mm” M.L. Radhuber, M.C. Sumner, J.A. Kroll, D.C. Lis, B.A. McGuire, J. Zmuidzinas, G.A. Blake, & S.L. Widicus Weaver 2011, *Ap. J.*, submitted.

INVITED REVIEWS AND CONFERENCE PROCEEDINGS
(Extended Abstracts not included)

- [1] “Determination of the Dipole Moments of Molecular Ions from the Rotational Zeeman Effect by Tunable Far-IR Laser Spectroscopy” Kenneth B. Laughlin, Geoffrey A. Blake, Ronald C. Cohen, David C. Hovde, & Richard J. Saykally 1988, *Phil. Trans. Roy. Soc. London A* **234**, 109-119.
- [2] “Chemistry in Dense Molecular Clouds: Observational Constraints” Geoffrey A. Blake 1988, *Molecular Clouds in the Milky Way and External Galaxies*, R.L. Dickman, R.L. Snell, J.S. Young, eds. (Springer-Verlag Publ., Berlin) pp. 132-150.
- [3] “Carbon Chemistry in Dense Molecular Clouds: Theory and Observational Constraints” Geoffrey A. Blake 1990, *Carbon in the Galaxy: Observations from the Ground and Space*, J. Tarter, S. Chang, D.J. De Frees, eds. (NASA Conference Proceeding #3061) pp. 159-179.
- [4] “The Cosmochemistry of Protostellar Matter” Ewine F. van Dishoeck, Geoffrey A. Blake, & L.G. Mundy 1990, *Proc. of the 24th ESLAB Symp. on the Formation of Stars & Planets and the Evolution of the Solar System*, B. Battrick, ed. (ESA, Noordwijk), pp. 27-34.
- [5] “Tunable Far-Infrared Laser Spectrometers” Geoffrey A. Blake, Kenneth B. Laughlin, Ronald C. Cohen, Kerry L. Busarow, Duo H. Gwo, Charlie A. Schmuttenmaer, David W. Steyert, & Richard J. Saykally 1991, *Rev. Sci. Instr.* **62**, 1693-1700.
- [6] “The Orion Nebula” Geoffrey A. Blake 1992, *Chemistry and Spectroscopy of Interstellar Molecules*, D.K. Bohme, E. Herbst, N. Kaifu, & S. Saito, eds. (University of Tokyo Press, Tokyo), pp. 57-62.
- [7] “Systematics of Isotope Ratio Measurements with Resonant Laser Photoionization Sources” Rainer K. Wunderlich, Ian D. Hutcheon, Gerald J. Wasserburg, & Geoffrey A. Blake 1992, *Applied Spectroscopy in Materials Science II SPIE Vol. 1636*, 211-216.
- [8] “Systematics of the Odd-Even Effect in the Resonance Ionization of Os and Ti” Rainer K. Wunderlich, Gerald J. Wasserburg, Ian D. Hutcheon, & Geoffrey A. Blake 1992, *Inst. Phys. Conf. Ser. No. 128, Section 3*, 127-130.
- [9] “Measurement of Isotopic Ratios by Resonance Ionization Mass Spectrometry in the Presence of Optical Isotope Shifts” R.K. Wunderlich, Gerald J. Wasserburg, I.D. Hutcheon, & Geoffrey A. Blake 1992, *Inst. Phys. Conf. Ser. No. 128, Section 6*, 229-232.
- [10] “The Chemical Evolution of Protostellar and Protoplanetary Matter” Ewine F. van Dishoeck, Geoffrey A. Blake, Bruce T. Draine, & Jonathan I. Lunine 1992, *Protostars and Planets III*, E.H. Levy & J. Lunine, eds., (University of Arizona Press, Tucson) pp. 163-241.
- [11] “Molecular Interactions and Hydrogen Bond Tunneling Dynamics: Some New Perspectives” Richard J. Saykally & Geoffrey A. Blake 1993, *Science* **259**, 1570-1575.
- [12] “Submillimeter Spectroscopy of Interstellar Hydrides” Jonas Zmuidzinas, Geoffrey A. Blake, John Carlstrom, Jocelen Keene, David Miller, Peter Schilke, & Nicholas G. Ugras

- 1995, *Proceedings of the Airborne Astronomy Symposium*, M.R. Haas, J.A. Davidson and E.F. Erickson, eds. (San Francisco: ASP), pp. 33-40.
- [13] “Observations of Chemical Processing in the Circumstellar Environment” Lee G. Mundy, Joe P. McMullin & Geoffrey A. Blake 1995, *Astro. Sp. Sc.* **224**, 81-84.
- [14] “Chemical Evolution of Circumstellar Matter Around Young Stellar Objects” Ewine F. van Dishoeck & Geoffrey A. Blake 1995, *Astro. Sp. Sc.* **224**, 237-249.
- [15] “High Angular Resolution Observations of the Gas Phase Composition of Young Stellar Objects” Geoffrey A. Blake 1997, *Proceedings of the IAU 178 Symposium*, E.F. van Dishoeck, ed. (Kluwer Academic, Dordrecht), pp. 31-44.
- [16] “Molecular Outflows and 1000 AU Structure of Low Mass YSO Envelopes” Michiel R. Hogerheijde, Ewine F. van Dishoeck, Geoffrey A. Blake, & Huib Jan van Langevelde 1997, in *Low-mass star formation: From infall to outflow*, *Proc. IAU Symp. 182*, F. Malbet & A. Castets, eds. (Grenoble), pp. 138-140
- [17] “Observations of Dust and Molecules in the Disks and Envelopes of Young Stellar Objects” Michiel R. Hogerheijde, Ewine F. van Dishoeck, & Geoffrey A. Blake 1997, in *The Cosmic Dust Connection*, *Proc. NATO Adv. School on Space Chem.*, J.M. Greenberg, ed. (Kluwer Academic, Dordrecht), pp. 521-526.
- [18] “Search for H₂ Emission from Disks Around T Tauri and Herbig Ae Stars” Ewine F. van Dishoeck, Wing F. Thi, Geoffrey A. Blake, Vince G. Mannings, Anneila I. Sargent, & Lee G. Mundy 1998, *ISO’s View on Stellar Evolution*, R. Waters and K.A. van der Hucht, eds. *Astro. Sp. Sc.* **255**, 77-82.
- [19] “A High Power Frequency-Stabilized Tunable Two-Frequency Diode Laser System for the Generation of Coherent THz-Waves by Photomixing” Shuji Matsuura, Geoffrey A. Blake, Pin Chen, John C. Pearson, & Herbert M. Pickett 1998, *Proceedings of the Space THz Conference*, 445-451.
- [20] “Chemical Evolution of Star-Forming Regions” Ewine F. van Dishoeck & Geoffrey A. Blake 1998, *Annual Reviews of Astron. Astrophys.* **36**, 317-68.
- [21] “H₂ Emission from Disks around Herbig Ae and T Tauri Stars” W.F Thi, Ewine F. van Dishoeck, Geoffrey A. Blake et al. 1999, *The Universe as Seen by ISO*, P. Cox & M. Kessler, eds., SP-427, Vol. 1 (ESA, Noordwijk), pp. 529-532.
- [22] “ISO Spectroscopy of Young Stellar Objects” Ewine F. van Dishoeck et al. 1999, *The Universe as Seen by ISO*, P. Cox & M. Kessler, eds., SP-427, Vol. 1 (ESA, Noordwijk), pp. 437-448.
- [23] “Traveling-Wave Photomixers Based on Non-Colinear Optical/THz Phase Matching” Shuji Matsuura, Geoffrey A. Blake, Rolf A. Wyss, J.C. Pearson, Christoph Kadow, Andrew W. Jackson, & Arthur C. Gossard 1999, *Proceedings of the 10th International Space THz Conference*, pp. 38-47.
- [24] “Design and Characterization of Optical-THz Phase Matched Traveling-Wave Photomixers” Shuji Matsuura, Geoffrey A. Blake, Rolf A. Wyss, J.C. Pearson, Christoph Kadow, Andrew W. Jackson, & Arthur C. Gossard 1999, *Proceedings of the SPIE* **Vol. 3795** (THz and GHz Photonics), pp. 484-492.
- [25] “Self-assembled ErAs Islands in GaAs for THz Applications” Christoph Kadow, Andrew W. Jackson, Arthur C. Gossard, James E. Bowers, Shuji Matsuura, & Geoffrey A. Blake 2000, *Physica E* **7**, 97.

- [26] “Chemical Evolution of Protostellar Matter” William D. Langer, Ewine F. van Dishoeck, Edward A. Bergin, Geoffrey A. Blake, Alexander G.G.M. Tielens, Thangasamy Velusamy, & Douglas B. Whittet 2000, *Protostars & Planets IV*, V.G. Mannings, A.P. Boss, S. Russell, eds., pp. 29-58.
- [27] “Microwave and THz Spectroscopy” Geoffrey A. Blake 2001, *Encyclopedia of Chemical Physics & Physical Chemistry*, J. Moore, N. Spencer, eds. (Institute of Physics Publ., Bristol), pp. 31-44.
- [28] “Unravelling the Chemical Structure of Young Stellar Objects with ALMA” Ewine F. van Dishoeck & Geoffrey A. Blake 2001, *Science with the Atacama Large Millimeter Array*, A. Wootten, ed. (ASP Conference Series, Vol. 235), pp.89-98.
- [29] “Tracing Protostellar Evolution by Observations of Ices” A.C.A. Boogert, Geoffrey A. Blake, & M.R. Hogerheijde 2003, *Chemistry as a Diagnostic of Star Formation* Charles L. Curry & Michael Fitch, eds. (NRC Press, Ottawa), pp. 172-177.
- [30] “Chemistry in Circumstellar Disks as Traced by Millimeter and Infrared Spectroscopy” Geoffrey A. Blake 2003, *Chemistry as a Diagnostic of Star Formation*, Charles L. Curry & Michael Fitch, eds. (NRC Press, Ottawa), pp. 178-187.
- [31] “Deuterium in Protoplanetary Disks” Jacqueline E. Kessler, Geoffrey A. Blake, & C. Qi 2003, *Chemistry as a Diagnostic of Star Formation*, Charles L. Curry & Michael Fitch, eds. (NRC Press, Ottawa), pp. 188-192.
- [32] “High Resolution Mm-Wave to Infrared Spectroscopy of Circumstellar Disks” Geoffrey A. Blake 2004, *Debris Disks and the Formation of Planets: A Symposium in Memory of Fred Gillett*, D. Backman & L. Caroff, eds. (ASP Conference Series, Vol. 324), pp. 79-92.
- [33] “Millimeter-wave Observations of Gaseous Species in Disks” Geoffrey A. Blake 2006, *Proceedings of the IAU 231 Symposium on Astrochemistry: Recent Successes and Current Challenges*, D.C. Lis, G.A. Blake & E. Herbst, eds. (Springer), pp. 365-376.
- [34] “The Chemical Evolution of Protoplanetary Disks” Edwin A. Bergin, Yuri Aikawa, Geoffrey A. Blake, & Ewine F. van Dishoeck 2006, *Protostars & Planets V*, B. Reipurth, D. Jewitt, & K. Keil, eds. (Univ. Arizona Press, Tucson), pp. 751-766.
- [35] “Water and related chemistry in the solar system. A guaranteed time key programme for Herschel” P. Hartogh et al. 2009, *Planet. Sp. Sc.* **57**, 13, 1596-1606.
- [36] “THz Spectroscopy in the Lab and at Telescopes” Geoffrey A. Blake 2010, *Submillimeter Astrophysics and Technology: A Symposium Honoring Thomas G. Phillips*, D.C. Lis, J.E. Vaillancourt, P.F. Goldsmith, T.A. Bell, N.Z. Scoville, & J. Zmuidzinas, eds. (ASP Conference Series, Vol. 417), pp. 231-241.
- [37] “Planet-forming Regions at the Highest Spectral and Spatial Resolution with VLT-CRIRES” Pontoppidan, K.M., van Dishoeck, E., Blake, G.A., Smith, R., Brown, J., Herczeg, G.J., Bast, J., Mandell, A., Smette, A., Thi, W.-F., Young, E.D., Morris, M.R., Dent, W., & Käuffel, H. U. 2011, *The Messenger* **143**, 32-36.

BOOKS EDITED

- [1] “Astrochemistry throughout the Universe: Recent Successes and Current Challenges” 2006 (IAU Symp. #231), D.C. Lis, G.A. Blake & E. Herbst, Eds. (Dordrecht: Kluwer), 524 pp.

TEACHING EXPERIENCE

Ch 21b. The Physical Description of Chemical Systems. Quantum mechanics (Ch21a, M. Okumura); atomic and molecular spectroscopy (Ch21b, G. Blake); thermodynamics, statistical mechanics, and chemical kinetics (Ch21c, T. Miller).

Ge 104/5. Geochemistry. An introduction to geochemical principles and techniques, with an emphasis on the composition of global reservoirs and the mechanisms and time scales for coupling between them. Origin of the elements and their classification; origin of the terrestrial planets. Partitioning of major and trace elements in the Earth; geochemical cycles. Isotope geochemistry of stable and radiogenic nuclides; geothermometry, and geochronology. Geochemical modeling of environmental pollution. Course content now folded into Ge 101 (Ge 104 has become the introductory graduate course in Geobiology).

Ch/Ge 128. Cosmochemistry. The chemistry of the interstellar medium, of protostellar nebulae, and of primitive solar system objects with a view towards establishing the relationship of chemical evolution of atoms in the interstellar radiation field to complex molecules and aggregates in the early solar system. Emphasis is placed on identifying the physical conditions in various objects, time scales for physical and chemical change, chemical processes leading to change, observational constraints, and various models which attempt to describe the chemical state and history of cosmological objects in general and the early solar system in particular.

Ch 130. Spectroscopy. Discussion of various topics in modern spectroscopy, concentrating on the use of lasers in chemistry. Group and permutation-inversion theory with applications to molecular structure and spectroscopy.

Ay/Ge 132. Atomic and Molecular Processes in Astronomy and Planetary Science. Fundamental aspects of atomic and molecular spectra that enable one to infer physical conditions in astronomical, planetary, and terrestrial environments. Topics include the structure and spectra of atoms, molecules, and solids; transition probabilities; photoionization/recombination; collisional processes; gas-phase reactions; and isotopic fractionation. Each topic will be illustrated with applications in astronomy and planetary science, ranging from the early universe to dense interstellar clouds and the solar system.

Ay/Ge 133. The Formation and Evolution of Planetary Systems. Review current theoretical ideas and observations pertaining to the formation and evolution of planetary systems. Topics to be covered include low mass star formation, the protoplanetary disk, accretion and condensation in the solar nebula, the formation of gas giants, meteorites, the outer solar system, giant impacts, extrasolar planetary systems.

These courses are aimed primarily at the advanced undergraduate and/or first year graduate level. Ch/Ge 128, Ay/Ge 132+133, and Ge 104/105 are “new” courses, in that they were not taught before my arrival. Student feedback has consistently been quite positive, and web sites are available for all currently taught courses (see <http://www.gps.caltech.edu/~gab/classes.html>). I firmly believe that as a faculty member it is important to be involved with educational opportunities at all levels in the Institute and the local community, and as such devote a that fraction of my time to teaching consistent with leading a world class research effort. For example, I have regularly participated in a variety of Division field courses, both to learn about the geological sciences

and to interact with students in a unique setting. I have also lived on campus as a Resident Faculty member of Avery House for the first two years of its existence, and am currently the Master of Student Houses (MOSH) at Caltech. For four+ years I served as the Faculty Chair of the Caltech MURF Advisory Committee and the Caltech Undergraduate Admissions Committee. In addition, I have attended Frosh Camp on several occasions, and have participated as a science professional in the Project CAPSI/SEED programs for the past decade.