

## Refereed Publications

Plambeck, R. L., Wright, M. C. H., **Friedel, D. N.**, Widicus Weaver, S. L., Bolatto, A. D., Pound, M. W., Woody, D. P., Lamb, J. W., & Scott, S. L. 2009, "Tracing the Bipolar Outflow from Orion Source I", *Astrophysical Journal*, accepted

Hogerheijde, Michiel R., Qi, Chunhua, de Pater, Imke, Blake, Geoffrey, A., **Friedel, D. N.**, Forster, J. R., Palmer, Patrick, Remijan, Anthony J., Snyder, L. E., & Wright, M. C. H. 2009, "Simultaneous Observations of Comet C/2002 T7 (LINEAR) with the Berkeley-Illinois-Maryland Association and Owens Valley Radio Observatory Interferometers: HCN and CH<sub>3</sub>OH", *Astronomical Journal*, 137,4837

Remijan, Anthony J., Milam, Stefanie N., Womack, Maria, Apponi, A. J., Ziurys, L. M., Wyckoff, Susan, A'Hearn, M. F., de Pater, Imke, Forster, J. R., **Friedel, D. N.**, Palmer, Patrick, Snyder, L. E., Veal, J. M., Woodney, L. M., & Wright, M. C. H. 2008, "The Distribution, Excitation, and Formation of Cometary Molecules: Methanol, Methyl Cyanide, and Ethylene Glycol", *Astrophysical Journal*, 689. 613

**Friedel, D. N.** & Snyder, L. E. 2008, "High Resolution  $\lambda=1$ mm CARMA Observations of Large Molecules in Orion-KL", *Astrophysical Journal*, 672, 962

Milam, Stefanie N., Remijan, Anthony J., Womack, Maria, Abrell, Leif, Ziurys, L. M., Wyckoff, Susan, Apponi, A. J., **Friedel, D. N.**, Snyder, L. E., Veal, J. M., Palmer, Patrick, Woodney, L. M., A'Hearn, Michael F., Forster, J. R., Wright, M. C. H., de Pater, I., Choi, S., & Gesmundo, M. 2006, "Formaldehyde in Comets C/1995 O1 (Hale-Bopp), C/2002 T7 (LINEAR), and C/2001 Q4 (NEAT): Investigating the Cometary Origin of H<sub>2</sub>CO", *Astrophysical Journal*, 649, 1169

Remijan, Anthony J., Friedel, D. N., de Pater, Imke, Hogerheijde, M. R., Snyder, L. E., A'Hearn, M. F., Blake, Geoffrey A., Dickel, H. R., Forster, J. R., Kraybill, C., Looney, L. W., Palmer, Patrick, & Wright, M. C. H. 2006, "A BIMA Array Survey of Molecules in Comets Linear (C/2002 T7) and Neat (C/2001 Q4)", *Astrophysical Journal*, 643, 567

**Friedel, D. N.**, Snyder, L. E., Remijan, Anthony J., & Turner, B. E., 2005, "Detection of Interstellar Acetone Toward the Orion-KL Hot Core", *Astrophysical Journal Letters*, 632, L95

**Friedel, D. N.**, Remijan, Anthony J., Snyder, L. E., A'Hearn, M. F., Blake, Geoffrey A., de Pater, Imke, Dickel, H. R., Forster, J. R., Hogerheijde, M. R., Kraybill, C., Looney, L. W., Palmer, Patrick, & Wright, M. C. H., 2005, "BIMA Array Detections of HCN in Comets LINEAR (C/2002 T7) and NEAT (C/2001 Q4)", *Astrophysical Journal*, 630, 623

Remijan, Anthony J., Wyrowski, Friedrich, **Friedel, D. N.**, Meier, D. S., & Snyder, L. E. 2005, "A Survey of Large Molecules toward the Protoplanetary Nebula CRL 618", *Astrophysical Journal*, 626, 233

Snyder, L. E., Lovas, F. J., Hollis, J. M., **Friedel, D. N.**, Jewell, P. R., Remijan, A., Ilyushin, V. V., Alekseev, E. A., & Dyubko, S. F. 2005, "A Rigorous Attempt to Verify Interstellar Glycine", *Astrophysical Journal*, 619, 914

Remijan, A., Shiao, Y.-S., **Friedel, D. N.**, Meier, D. S., Snyder, L. E. 2004, "A Survey of Large

Molecules of Biological Interest Toward Selected High Mass Star Forming Regions”, *Astrophysical Journal*, 617, 384

Remijan, A., Sutton, E. C., Snyder, L. E., **Friedel, D. N.**, Liu, S.-Y., & Pei, C.-C. 2004, “High-Resolution Observations of Methyl Cyanide (CH<sub>3</sub>CN) toward the Hot Core Regions W51e1/e2”, *Astrophysical Journal*, 606, 917

**Friedel, D. N.**, Snyder, L. E., Turner, B. E., & Remijan, A. 2004, “A Spectral Line Survey of Selected 3 Millimeter Bands toward Sagittarius B2(N-LMH) Using the National Radio Astronomy Observatory 12 Meter Radio Telescope and the Berkeley-Illinois-Maryland Association Array. I. The Observational Data”, *Astrophysical Journal*, 600, 243

Remijan, A., Snyder, L. E., **Friedel, D. N.**, Liu, S.-Y., & Shah, R. Y. 2003, “A Survey of Acetic Acid toward Hot Molecular Cores”, *Astrophysical Journal*, 590, 314

#### Invited Talks

**Friedel, D. N.** & Widicus Weaver, S. L. 2009, “High Resolution  $\lambda=3$ mm Studies of Organic Molecules in Orion-KL”, *238<sup>th</sup> Meeting of the American Chemical Society*

#### Conference Proceedings

**Friedel, D. N.**, Kembell, Athol, & Fields, Brian 2009, “Cosmological Nucleosynthesis: The Lithium Problem”, *64<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

Kuo, H.-L., Snyder, L. E., **Friedel, D. N.**, Looney, L. W., McCall, B. J. Remijan, A. J., Lovas, F. J., & Hollis, J. M. 2009, “A Search for Interstellar Urea with CARMA”, *64<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.** & Widicus Weaver, Susanna L. 2009, “The Origins of Ethyl Cyanide and Dimethyl Ether in the Interstellar Medium”, *64<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.** & Widicus Weaver, Susanna L. 2008, “Probing the Chemical Complexity of High Mass Star Forming Regions”, *63<sup>rd</sup> Ohio State University Symposium on Molecular Spectroscopy*

Shiao, Y.-S., Looney, L. W., Snyder, L. E., **Friedel, D. N.**, & Remijan, A. J. 2008, “An Acetic Acid Survey Toward High- and Low-Mass Star Forming Regions”, *63<sup>rd</sup> Ohio State University Symposium on Molecular Spectroscopy*

Snyder, L. E., Kuo, H.-L., **Friedel, D. N.**, Looney, L. W., McCall, B. J., Remijan, A. J., Lovas, F. J., & Hollis, J. M. 2008, “Using a Search for Interstellar Urea to Test the Ability of CARMA to Detect New Molecules”, *63<sup>rd</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.** & Snyder, L. E. 2008, “CARMA Observations of Large Organic Molecules in Orion-KL”, *211<sup>th</sup> Meeting of the American Astronomical Society*

**Friedel, D. N.** & Looney, L. W. 2007, “Astrochemistry with the Combined Array for Research in Millimeter-Wave Astronomy”, *62<sup>nd</sup> Ohio State University Symposium on Molecular Spectroscopy*

Shiao, Y.-S., **Friedel, D. N.**, Remijan, A. J., Looney, L. W., & Snyder, L. E. 2007, "The First Acetic Acid Survey from CARMA", *62<sup>nd</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Snyder, L. E., & Remijan, A. J. 2007, "The Kinematics of the Orion-KL Region from High Resolution CARMA Observations", *62<sup>nd</sup> Ohio State University Symposium on Molecular Spectroscopy*

Kuo, H.-L., **Friedel, D. N.**, Looney, L. W., Snyder, L. E., Widdicus Weaver, S. L., & McCall, B. J. 2007, "Preparation for the Astronomical Search for Protonated Methanol", *62<sup>nd</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Snyder, L. E., & Remijan, A. J. 2007, "High Resolution CARMA Observations of Acetone [(CH<sub>3</sub>)<sub>2</sub>CO] in the Orion-KL Region", *62<sup>nd</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Snyder, L. E., Remijan, Anthony J., & Turner, B. E. 2006, "Analysis of the 3 MM spectrum of Orion-KL from the BIMA Array", *61<sup>st</sup> Ohio State University Symposium on Molecular Spectroscopy*

Shiao, Y.-S., Looney, L. W., **Friedel, D. N.**, Snyder, L. E., Sutton, E. C., "Increasing Sensitivity to Large Molecules: The Importance of Phase correction to Millimeter Arrays", *61<sup>st</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Remijan, A., Snyder, L. E., A'Hearn, M. F., Blake, G. A., de Pater, I., Dickel, H. R., Forster, J. R., Hogerheijde, M. R., Kraybill, C., Looney, L. W., Palmer, P., & Wright, M. C. H. 2005, "BIMA Array observations of Comets LINEAR (C/2002 T7) and NEAT (C/2001 Q4)", *60<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Snyder, L. E., Turner, B. E., & Remijan A. 2005, "BIMA Array 3mm Spectral Line Survey of Orion-KL", *60<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

Remijan, A. J., Wyrowski, F., **Friedel, D. N.**, Meier, D. S., & Snyder, L. E. 2005, "Survey of Large Molecules Toward the Protoplanetary Nebula CRL 618", *60<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Remijan, A., Snyder, L. E., A'Hearn, M. F., Blake, G. A., de Pater, I., Dickel, H. R., Forster, J. R., Hogerheijde, M. R., Kraybill, C., Looney, L. W., Palmer, P., & Wright, M. C. H., 2004, "BIMA Array observations of Comets LINEAR (C/2002 T7) and NEAT (C/2001 Q4)", *36<sup>th</sup> Meeting of the Division of Planetary Sciences, American Astronomical Society*, 36, 2506

Remijan, A., Snyder, L. E., **Friedel, D. N.**, Veal, J. M., Palmer, Patrick, Woodney, L. M., A'Hearn, Michael F., Forster, J. R., Wright, M. C. H., & de Pater, I. 2004, "A BIMA Array Search for Biomolecules in Comet Hale-Bopp(C/1995 O1)", *36<sup>th</sup> Meeting of the Division of Planetary Sciences, American Astronomical Society*, 36, 3202

Kim, K.-T., Churchwell, E., **Friedel, D. N.**, & Sewilo, M. 2004, "Molecular Outflows from Massive Protostars", *59<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

Remijan, A., Sutton, E. C., Snyder, L. E., **Friedel, D. N.**, Liu, S.-Y., & Pei, C.-C. 2004, “High-Resolution Observations of Methyl Cyanide (CH<sub>3</sub>CN) toward the Hot Core Regions W51e1/e2”, *59<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

**Friedel, D. N.**, Snyder, L. E., Turner, B. E., & Remijan, A. 2004, “A Spectral Line Survey of Selected 3 Millimeter Bands toward Sagittarius B2(N-LMH) Using the National Radio Astronomy Observatory 12 Meter Radio Telescope and the Berkeley-Illinois-Maryland Association Array. II. Data Analysis”, *59<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

Remijan, A., Sutton, E. C., Snyder, L. E., **Friedel, D. N.**, Liu, S.-Y., & Pei, C.-C., 2004, “High-Resolution Observations of Methyl Cyanide (CH<sub>3</sub>CN) toward the Hot Core Regions W51e1/e2”, *204<sup>th</sup> Meeting of the American Astronomical Society*, 204, 6116

**Friedel, D. N.**, Snyder, L. E., Turner, B. E., & Remijan, A. J. 2003, “A  $\lambda=3$  mm Spectral Line Survey of Sagittarius B2(N-LMH) with the BIMA Array and NRAO 12 Meter Radio Telescope”, *58<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*

Snyder, L. E., Remijan, A. J., Lovas, F. J., **Friedel, D. N.**, & Liu, S.-Y., “Interstellar Urea [(NH<sub>2</sub>)<sub>2</sub>CO]”, *58<sup>th</sup> Ohio State University Symposium on Molecular Spectroscopy*