

## Process Measurements Division

### 1. Publications

Afridi, M.Y., Suehle, J.S., Zaghoul, M.E., Tiffany, J.E. and Cavicchi, R.E., ***“Implementation of CMOS Compatible Conductance-Based Micro-Gas-Sensor System,”*** Proc. of the European Conference on Circuit Theory and Design (III), p. 381-384 (2001).

Afridi, M.Y., Suehle, J.S., Zaghoul, M.E., Berning, D.W., Hefner, A.R., Semancik, S., and Cavicchi, R.E., ***“A Monolithic Implementation of Interface Circuitry for CMOS Compatible Gas-Sensor System,”*** Proc. 2002 IEEE Intl. Symposium on Circuits and Systems, Vol. 2, p. II/732 (2002).

Avedisian, C.T., Presser, C., and Gupta, A.K., ***“Observations of Soot in the Combustion of Methanol/Toluene Spray Flames,”*** J. of Propulsion and Power 4, Vol. 18, p. 781-787 (2002).

Barker, S.L., Tarlov, M.J., Ross, D.J., Waddell, E.A., and Locascio, L.E., ***“Fabrication, Derivatization and Applications of Plastic Microfluidic Devices,”*** Proc. of SPIE Intl. Soc. For Optical Engineering, Vol. 4205, p. 112-118, (2001).

Benz, S. P., Martinis, J. M., Nam, S. W., Tew, W. L., White, D. R., ***“A New Approach to Johnson Noise Thermometry using a Josephson Quantized Voltage Source for Calibration”***, Proc. TEMPMEKO 2001, Vol. 1, p. 37-45 (2002).

Berg, R.F., and Cignolo, G., ***“NIST-IMGC Comparison of Gas Flows Below 1 Liter per Minute,”*** Metrologia (in press).

Berg, R.F., and Tison, S.A., ***“Two Primary Standards for Low Flows of Gases,”*** Proc. of 5<sup>th</sup> International Symposium on Fluid Flow Measurement, on CD (2002).

Blevins, L., Fernandez, G., Mulholland, G., Davis, R.W., Moore, E.F., Steel, E., and Scott, J., ***“COSMIC: Carbon Monoxide and Soot in Microgravity Inverse Combustion,”*** Proc. 6<sup>th</sup> NASA Intl. Microgravity Combustion Workshop, NASA/CP-2001-210826, p. 177-180 (2001).

Campbell, S.A., He, B., Smith, R.C., Ma, T., Hoilen, N., Taylor, C.J., and Gladfelter, W.L., ***“Group IVB Metal Oxides High Permittivity Gate Insulators Deposited from Anhydrous Metal Nitrates,”*** Proc. IEEE Transactions on Electron Devices, Vol. 48, p. 2348-2356 (2001).

Cormier, J.G., Hodges, J.T., and Drummond, J.R., ***“On the Application of Quantitative Cavity Ring Down Spectroscopy to Measurements of Line Shapes and Continuum Absorption,”*** Proc. 16<sup>th</sup> Intl. Conf. Spectral Line Shapes Vol. 12, AIP Conf. Proc. 645, p. 401-412 (ed. Christina Back (2002).

Crocker, D.S., Widmann, J.F., and Presser, C., ***“CFD Modeling and Comparison with Data from the NIST Reference Spray Combustor,”*** Proc. 2001 ASME Intl. Mechanical Engineering Conference & Exhibition, Vol. 1, HTD-24236 (on CD), Am. Soc. Mech. Eng. (2001).

DesJardin, P.E., Presser, C., Disimile, P.J., and Tucker, J.R., "***A Droplet Impact Model for Agent Transport in Engine Nacelles,***" Proc. 12<sup>th</sup> Halon Options Technical Working Conf. (HOTWC-2002), on CD, NIST Special Publication 984 (R.G. Gann, P.A. Peneke, eds.) (2002).

Driver, R.G., and Schmidt, J.W., "***NCSL Pressure Comparison at 0.69 MPa (1200 psi) and 1.4 MPa (200 psi),***" Proc. of NCSL Conf. 2000, on CD, (2002).

Ehrlich, C.D., and Schmidt, J.W., "***IUPAC Experimental Thermodynamics Volume VI: Measurement of the Thermodynamic Properties of Single Phases: CH. 3 Pressure; b) Piston Gauges,***" Experimental Thermodynamics Intl. Union of Pure and Applied Chemistry (in press).

Fellmuth, B., Head, D., Pavese, F., Szmyra-Grzebyk, Tew, W. L. , "***Special Problems when Realizing the Triple Point e-H<sub>2</sub> as a Defining Fixed Point of the ITS-90,***" Proc. TEMPMEKO 2001, Vol. 1, p. 403-411 (2002).

Furukawa, G.T., and Strouse, G.F., "***Investigation of the Non-Uniqueness of the ITS-90 in the Range 660 °C to 962 °C,***" Proc. TEMPMEKO 2001, Vol. 1, p. 553-558 (2002).

Gillis, K.A., Hurly, J.J., and Moldover, M.R., "***Accurate Measurements of Thermodynamic and Transport Properties of Industrial Gases with Acoustic Resonators,***" Proc. 17<sup>th</sup> Intl. Congress on Acoustics, on CD (2002).

Green, D.S., Looney, J.P., and Rubloff, G.W., "***Application of CW-CRDS to Monitor and Control Chemical Vapor Deposition,***" Proc. IEEE/LEOS Summer Topicals 2000, Optical Sensing in Semiconductor Manufacturing, p. 15-16 (2001).

Gupta, A.K., Megerle, M., Charagundla, S.R., and Presser, C., "***Spray Flame Characteristics with Steam-Assisted Atomization,***" Advances in Chemical Propulsion: Science to Technology (G.D. Roy, Ed.), CRC Press, Boca Raton, FL, p. 261-274 (2001).

Hagwood, C.H. Miiller, A.P., and Lee, A., "***Bayesian Methods in Calibration,***" Proc. NCSL Intl. 2001 Workshop and Symposium, on CD, (2001).

Huang, P.H., Scace, G.E., and Hodges, J.T., "***Referencing Dilution-Based Trace Humidity Generators to Primary Humidity Standards,***" Proc. TEMPMEKO 2001, Vol. 1, p. 573-578 (2002).

Huang, P.H., "***Repeatability and Reproducibility Uncertainty in the Measurement of Trace Moisture Generated Using Permeation-Tubes,***" Proc. 4<sup>th</sup> Intl. Symposium on Humidity and Moisture, Vol. 1, p. 45-54 (2002).

Huang, P.H., "***The Moisture Content of the Air in Equilibrium with Certain Desiccants,***" Proc. 4<sup>th</sup> Intl. Symposium on Humidity and Moisture, Vol. 1, p. 108-113 (2002).

Hurly, J.J., and Moldover, M.R., "***Progress Report: Thermophysical Properties of Semiconductor Manufacturing Process Gases,***" Proc. of SEMICOM West 2000: Workshop on Gas Distribution Systems (in press).

Hurly, J.J., ***“Thermophysical Properties of Chlorine from Speed-of-Sound Measurements,”*** Intl. J. of Thermophysics 23, p. 455-475 (2002).

Hurly, J.J., ***“The Thermophysical Properties of Process Gases via Acoustics,”*** Semiconductor Intl. (in press).

Hurly, J.J., ***“Thermophysical Properties of Nitrogen Trifluoride, Ethylene Oxide, and Trimethyl Gallium, from Speed-of-Sound Measurements,”*** Intl. J. of Thermophysics 23, p. 667-696 (2002).

Hurst, W.S., Hodes, M.S., Bowers, W.J., Bean, V.E., Maslar, J.E., and Smith, K.A., ***“Optical Flow Cell and Apparatus for Solubility, Salt Deposition and Raman Spectroscopic Studies in Aqueous Solutions near the Water Critical Point,”*** J. of Supercritical Fluids 22, p. 157-166 (2002).

Indekeu, J.O., Posazhennikova, A.I., Ross, D., Bonn, D., and Meunier, J., ***“Crossover from First-Order to Critical Wetting in Methanol on Alkanes,”*** J. of Physics Condensed Matter 14 (19), p. 4777-4783 (2002).

Johnson, T.J., Ross, D., and Locascio, L.E., ***“Rapid Microfluidic Mixing,”*** Analytical Chemistry 74, Vol. 1, p. 45-51 (2002).

Kobata, T., Schmidt, J.W., and Olson, D.A., ***“Characterization of a Controlled-Clearance Piston Gauge using the Heydemann-Welch Model,”*** Proc. of the Society of Instrument and Control Engineers, on CD (2002).

Kreider, K.G., Allen, D.W., Chen, D.H., DeWitt, D.P., Meyer, C.W., and Tsai, B.K., ***“Effects of Wafer Emissivity on Lightpipe Radiometry in RTP Tools,”*** Proc. 9th Intl. Conf. on Advanced Thermal Processing of Semiconductors, p. 163-168 (2001).

Kreider, K.G., Chen, D.H., DeWitt, D.P., Kimes, W.A., Meyer, C.W., and Tsai, B.K., ***“Wafer Emissivity Effects on Lightpipe Radiometry in RTP,”*** ECS Proc., Rapid Thermal Processing Technologies III, Vol. 2002-11, p. 273-281 (2001).

Kreider, K.G., Kimes, W.A., Meyer, C.W., Ripple, D.C., Tsai, B.K., Chen, D.H., and DeWitt, D.P., ***“Calibration Radiation Thermometers in Rapid Thermal Processing Tools using Si Wafers with Thin Film Thermocouples,”*** Proc. 8<sup>th</sup> Symposium on Temperature (in press).

Kremer, D.M., Davis, R.W., Moore, E.F., Maslar, J.E., Burgess, D.R., and Ehrman, S.H., ***“An Investigation of Particle Dynamics in a Rotating Disk Chemical Vapor Deposition Reactor,”*** J. of the Electrochemical Society (in press).

Kremer, D.M., Davis, R.W., Moore, E.F., and Ehrman, S.H., ***“A Numerical Investigation of the Effects of Gas-Phase Particle Formation on Silicon Film Deposition from Silane,”*** J. of Crystal Growth (in press).

Kremer, D.M., Davis, R.W., Moore, E.F., and Ehrman, S.H., ***“A Numerical Investigation of Aerosol Dynamics in a Wall-less Reactor,”*** *Aerosol Science and Technology* (in press).

Lehman, S.Y., Bertness, K.A., and Hodges, J.T., ***“Detection of Trace Water in Phosphine with Cavity Ring-Down Spectroscopy,”*** *J. of Crys. Growth* (in press).

Mangum, B.W., Furukawa, G.T., Kreider, K.G., Meyer, C.W., Moldover, M.R., Ripple, D. C., Strouse, G.F., Tew, W.L., Saunders, R.D., Johnson, B.C., Yoon, H.W., and Gibson, C.E., ***“The Kelvin and Temperature Measurements,”*** *J. of Res. of the National Institute of Standards and Technology* 106, p. 105-149 (2001).

Mangum, B.W., Strouse, G.F., and Guthrie, W.F., ***“CCT-K3: Key Comparison of Realizations of the ITS-90 over the Range 83.8058 K to 933.473 K,”*** NIST Technical Note 1450, p. 393 (2002)

Mangum, B.W., Strouse, G.F., Guthrie, W.F., Pello, R., Stock, M., Renaot, E., Hermier, Y., Bonnier, G., Marcarino, P., Gam, K.S., Kang, K.H., Kim, Y.-G., Nicholas, J.V., White, D.R., Dransfield, T.D., Duan, Y., Qu, Y., Connolly, J., Rusby, R.L., Gray, J., Sutton, G.J.M., Head, D.I., Hill, K.D., Steele, A., Nara, K., Tegeler, E., Noatsch, U., Heyer, D., Fellmuth, B., Thiele-Krivoj, B., Duris, S., Pokhodun, A.I., Moiseeva, N.P., Ivanova, A.G., de Groot, M. J., and Dubbeldam, J. F., ***“Summary of Comparison of Realizations of the ITS-90 Over the Range 83.8058 K to 933.473 K: CCT Key Comparison 3,”*** *Metrologia* 39, p. 179-205 (2002).

Maslar, J.E., Hurst, W.J., Bowers, W.J., and Hendricks, J.H., ***“In-Situ Raman Spectroscopic Investigation of Zirconium-Niobium Alloy Corrosion Under Hydrothermal Conditions,”*** *J. of Nuclear Materials* 298, p. 239-247 (2001).

Maslar, J.E., Hurst, W.S., Bowers, W.J., and Hendricks, J.H., and Aquino, M.I., ***“In Situ Raman Spectroscopic Investigation of Nickel Hydrothermal Corrosion,”*** *Corrosion* 58, No. 3, p. 225-231 (2002).

Maslar, J.E., Hurst, W.S., Bowers, W.J., and Hendricks, J.H., ***“In Situ Raman Spectroscopic Investigation of Stainless Steel Hydrothermal Corrosion,”*** *Corrosion* 58, No. 9, p. 739-747 (2002).

Maslar, J.E., Hurst, W.S., Kremer, D.M., and Ehrman, S.H., ***“In Situ Gas-Phase Optical Measurements of Silane Decomposition in a Thermal Chemical Vapor Deposition Reactor,”*** *Electrochemical Society Proc.*, Vol. 2001-13, p. 168-175 (2001).

Mattingly, G.E., ***“Flow Measurement Proficiency Testing,”*** *Flow Measurement-Practical Guides for Measurement and Control*, 2<sup>nd</sup> Edition (Spitzer, D.W. editor) ISA-The Instrumentation, Systems, and Automation Society, p. 761-778 (2001).

Meyer, C.W., ***“Effects of Extraneous Radiation on the Performance of Lightpipe Radiation Thermometers,”*** *Proc. TEMPMEKO 2001*, Vol. 2, p. 937-942 (2002).

Meyer, C.W., and Tew, W.L., ***“The NIST Low Temperature ITS-90 Realization and Calibration Facilities,”*** *Temperature: Its Measurement and Control in Science and Technology* (in press).

Miiller, A.P., Bergoglio, M., Bignell, N., Fen, K.M.K., Hong, S.S., Jousten K., Mohan, P., Redgrave, F.J., and Sardi, M., ***“Final Report on Key Comparison CCM. P-K4 of Absolute Pressure Standards from 1 Pa to 1000 Pa,”*** *Metrologia* 39, Tech. Suppl. 07001 (2002)

Miiller, A.P., Cignolo, G., Fitzgerald, M.P., and Perkin, M.P., ***“Final Report on Key Comparison CCM. P-K5 of Differential Pressure Standards from 1 Pa to 1000 Pa,”*** *Metrologia* 39, Tech. Suppl. 07002 (2002).

Moldover, M.R., Marsh, K.N., Barthel, J.M., and Buchner, R., ***“Relative Permittivity and Refractive Index,”*** *Intl. Union of Pure and Applied Chemistry* (in press).

Nam, S.W., Benz, S.P., Martinis, J.M., Dresselhaus, P., Tew, W.L., and White, D.R., ***“A Ratiometric Method for Johnson Noise Thermometry Using a Quantized Voltage Noise Source,”*** *Temperature: Its Measurement and Control in Science and Industry* (in press).

Nam, S.W., Benz, S., Dresselhaus, P., Tew, W.L., White, D.R., and Martinis, J.M., ***“Johnson Noise Thermometry Measurements Using a Quantized Voltage Noise Source for Calibration,”*** *IEEE Transactions on Instrumentation and Measurement* (in press).

Olsen, K.G., Ross, D.J., and Tarlov, M.J., ***“Immobilization of DNA Gel Plugs in Microfluidic Channels,”*** *Analytical Chemistry* 74, Vol. 6, p. 1436-1441 (2002).

Olson, D.A., and Kobata, T., ***“Automating the Calibration of Two Piston Gage Pressure Balances,”*** *Proc. 2002 NCSL Intl. Workshop & Symposium*, on CD (2002).

Olson, D.A., ***“Capabilities and Uncertainties of the Piston Gage Pressure Standards at NIST,”*** *Proc. Advances in High Pressure Science and Technology*, p. 21-26 (2001).

Panchapakesan, B., Devoe, D., Cavicchi, R.E., and Semancik, S., ***“Nanoparticle Engineering and Control of Tin Oxide Microstructures for Chemical Microsensor Applications,”*** *J. of Nanotechnology* 12, Vol. 3, p.336-349 (2001).

Pipino, A.C., and Hodges, J.T., ***“Evanescent Wave Cavity Ring-Down Spectroscopy: A Future Technology for Process Sensing,”*** *J. of Process Analytical Chemistry* 7 (1), p. 21 (2002).

Presser, C., Widmann, J.F., and Papadopoulos, G., ***“Liquid Agent Transport Around Solid Obstacles,”*** *Proc. 12<sup>th</sup> Halon Options Technical Working Conf. (HOTWC-2002)*, on CD, NIST Special Publication 984 (R.G. Gann, P.A. Peneke, eds.) (2002).

Presser, C., Widmann, J.F., DesJardin, P.E., and Gritzko, L.A. ***“Measurement and Numerical Prediction of Homogeneous Turbulent Flow over a Cylinder: A Baseline for Droplet-Laden Flow Studies,”*** *AIAA 2002-0905, Am. Inst. Aero. Astro.* (2002).

Pugmire, D.L., Waddell, E.A., Haasch, R., Tarlov, M.J., and Locascio, L.E., **“Surface Characterization of Laser Ablated Polymers Used for Microfluidics,”** *Analytical Chem.* 74, Vol. 4, p. 871-878 (2002).

Ripple, D.C., and Burns, G.W., **“Variations in the Thermoelectric Behavior of Palladium Following Heat Treatment,”** *Proc. TEMPMEKO 2001*, Vol. 1, p. 61-66 (2002)

Ripple, D.C., Tew, W.L., and Strouse, G.F., **“The Role of High-Purity Noble Metals in Precision Thermometry,”** *Proc. SICON 01: Sensors for Industry Conf.*, p. 12-17 (2001).

Ripple, D.C., and Burns, G.W., **“Standard Reference Material 1749: Au/Pt Thermocouple Thermometer,”** NIST SP-260-134 (2002).

Ripple, D.C., **“Review of Traceable Temperatures and Temperature Measurement,”** IEEE Instrumentation and Measurement Magazine (2002).

Ross, D., Gaitan, M., and Locascio, L.E., **“Temperature Measurement and Control in Microfluidic Systems,”** *Proc. of Micro Total Analysis Systems 2001*, p. 239-241 (2001).

Ross, D., and Locascio, L.E., **“Microfluidic Temperature Gradient Focusing,”** *Analytical Chemistry* 75 (11), p. 2556-2564 (2002).

Ross, D., and Locascio, L.E., **“Temperature Gradient Focusing,”** *Proc. of MicroTas 2002 Conference* (in press).

Scace, G.E., and Hodges, J.T., **“Uncertainty of the NIST Low Frost-Point Humidity Generator,”** *Proc. TEMPMEKO 2001*, Vol. 1, p. 597-602 (2002).

Semancik, S. and Cavicchi, R.E., **“Micromachined Arrays as Sensor Platforms and Materials Research Tools,”** *Proc. of 3<sup>rd</sup> Intl. Aviation Security Technology Symp.* (in press).

Sobolewski, M.A., Wang, Y.C., and Goyette, A.N., **“Measurements and Modeling of Ion Energy Distributions in High-Density, Radio-Frequency Biased CF<sub>4</sub> Discharges,”** *J. of Applied Physics* 91 (10), p. 6303-6314 (2002).

Steffens, K.L., and Sobolewski, M.A., **“The Effect of Changing the Electrode Gap on the Spatial and Electrical Properties of O<sub>2</sub>/CF<sub>4</sub> Plasmas,”** *J. of Vacuum Science and Technology* (in press).

Strouse, G.F. and Lippiatt, J., **“Small Fixed-Point Cells for Use in Dry Well Block Calibrators,”** *Proc. TEMPMEKO 2001*, Vol. 2, p. 783-788 (2002).

Strouse, G.F., **“New NIST Mercury Triple-Point Cells,”** *Proc. TEMPMEKO 2001*, Vol. 1, p. 453-458 (2002).

Strouse, G.F., and Hill, K.D., ***“Performance Assessment of Resistance Ratio Bridges used for the Calibration of SPRTs,”*** *Temperature: Its Measurement and Control in Science and Industry*, 7, (in press).

Strouse, G.F., ***“Internal Measurement Assurance for the NIST Realization of the ITS-90 from 83.8 K to 1234.93 K,”*** *Temperature: Its Measurement and Control in Science and Industry* (in press).

Tarlov, M.J., and Steel, A.B., ***“DNA-Based Sensors,”*** *Biomolecular Films: Design, Function, and Applications* (in press).

Taylor, C.J. and Semancik, S., ***“The Use of Microhotplate Arrays as Microdeposition Substrates for Materials Exploration,”*** *Chemistry of Materials* 14 (4), p. 1671-1677 (2002).

Tew, W.L., Steele, A.G., and Pavese, F., ***“Archival and Theoretical Considerations for Isotopic Dependence in the e-H<sub>2</sub> Fixed Points,”*** *Proc. TEMPMEKO 2001*, Vol. 1, p. 429-435 (2002).

Tew, W.L., and Meyer, C.W., ***“Recent Results of NIST Realizations of the ITS-90 Below 84 K,”*** *Temperature: Its Measurement and Control in Science and Industry* (in press).

Tiffany, J.E., Cavicchi, R.E., and Semancik, S., ***“Microarray Study of Temperature Dependent Sensitivity and Selectivity of Metal/Oxide Sensing Interfaces,”*** *Proc. of SPIE*, Vol. 4205, p. 240-247 (2001).

van Zee, R.D., and Looney, J.P., ***“Preface to Cavity-Enhanced Spectroscopies,”*** *Cavity-Enhanced Spectroscopies*, Academic Press (2002).

Vaughn, C.D., and Strouse, G.F., ***“Overview of the NIST Industrial Thermometer Calibration Laboratory,”*** *Proc. TEMPMEKO 2001*, Vol. 2, p. 629-634 (2002).

Widmann, J.F., Presser, C., and Leigh, S.D., ***“Extending the Dynamic Range of Phase Doppler Interferometry Measurements,”*** *Atomization and Sprays* 4, Vol. 18, p. 781-787 (2002).

Widmann, J.F., Presser, C., and Leigh, S.D., ***“Improving Phase Doppler Volume Flux Measurements in Low Data Rate Applications,”*** *Measurement Science Technology* 12, p. 1180-1190 (2001).

Widmann, J.F., Presser, C., and Leigh, S.D., ***“Identifying Burst Splitting Events in Phase Doppler Interferometry Measurements,”*** *Atomization and Sprays* 6, Vol. 11, p. 711-733 (2001).

Widmann, J.F., and Presser, C., ***“A Benchmark Experimental Database for Multiphase Combustion Model Input and Validation,”*** *Combustion and Flame* 1 and 2, Vol. 129, p. 47-86 (2002).

Widmann, J.F., and Presser, C., ***“Measuring Droplet Arrival Times using Phase Doppler Interferometry,”*** *Proc. 15th Annual Conf. on Liquid Atomization and Spray Systems (ILASS Americas '02)*, p. 231-235 (2002).

Wright, J. D., ***“Laboratory Primary Standards, in Flow Measurement: Practical Guides for Measurement and Control,”*** 2<sup>nd</sup> edition, Spitzer, D. W., ed., The Instrumentation, Systems, and Automation Society, Research Triangle Park, North Carolina, p. 731-760, (2001).

Wright, J.D., and Johnson, A., ***“Design and Uncertainty Analysis for a PVTt Gas Flow Standard,”*** J. of Res. of the National Institute of Standards and Technology (in press).

Yeh, T.T., Johnson, A., Espina, P.I., and Yende, N., ***“Error Free Liquid Flow Diverters for Calibration Facilities,”*** Proc. ASME FEDSM’02 (in press).



## 2. Talks

Abbott, P.J., ***“Status Report for Key Comparison CCM.P-K3 in the Range  $10^{-6}$  to  $10^{-3}$  Pa,”*** BIPM, Sevres, France, May 21, 2002.

Abbott, P.J., ***“Apparatus for the Calibration of Gaseous Leaks into Atmospheric Pressure,”*** National Conference of Standards Laboratories Intl. (NCSLI) Conference, San Diego, CA, August 7, 2002.

Berg, R.F., ***“New Methods to Measure Gas Flow Rates at the National Institute of Standards and Technology,”*** Instituto de Metrologia “Gustavo Colonnetti,” Torino, Italy, October 1, 2001.

Berg, R.F., ***“Transfer Standard for Low Rates of Gas Flow,”*** AVS 48<sup>th</sup> Intl. Symposium, San Francisco, CA, November 1, 2001.

Berg, R.F., ***“Polymer-Like Viscosity Near the Critical Point of Xenon,”*** University of Virginia, Physics Dept., November 8, 2001. Invited.

Berg, R.F., ***“Two Primary Standards for Low Flows of Gases,”*** 5<sup>th</sup> Intl. Symposium on Fluid Flow Measurement, Washington, DC, April 8, 2002. Invited.

Berg, R.F., ***“Quartz Capillary Transfer Standard for Gas Flows Below 1 SLM,”*** 5<sup>th</sup> Intl. Symposium on Fluid Flow Measurement, Washington, DC, April 9, 2002. Invited.

Berg, R.F., ***“Oscillations of a Cylinder in a Shear-Thinning, Viscoelastic Fluid,”*** Poster Presentation, Thermo-2002, University of Maryland, College Park, MD, April 19, 2002.

Berg, R.F., ***“Polymer-Like Viscosity Near the Critical Point of Xenon,”*** Center for Nonlinear Science, Los Alamos National Laboratory, Los Alamos, NM, April 29, 2002.

Berg, R.F., ***“Oscillations of a Cylinder in a Shear-Thinning, Viscoelastic Fluid,”*** Center for Nonlinear Science, Los Alamos National Laboratory, Los Alamos, NM, April 29, 2002.

Cavicchi, R.E., ***“Differential Scanning Microcalorimeter,”*** 9th Intl. Meeting on Chemical Sensors, Boston, MA, July 7, 2002.

Cavicchi, R.E., ***“Sensing in the Liquid Phase by Bubble Nucleation,”*** 9th Intl. Meeting on Chemical Sensors, Boston, MA, July 8, 2002.

Chang, R.F., ***“Stability of the Effective Accommodation Coefficient of Spinning Rotor Gauges,”*** National Conference of Standards Laboratories Intl. (NCSLI) Conference, San Diego, CA, August 7, 2002.

Chang, R.F., and Looney, J.P., ***“Analysis of Flow Rate and its Uncertainties for the Bellows Flowmeter,”*** National Conference of Standards Laboratories Intl. (NCSLI) Conference, San Diego, CA, August 7, 2002.

Cormier, J.G., ***“Measuring Spectral Line Shapes and Continuum Absorption Using Cavity***

***Ring- Down Spectroscopy,***” 16<sup>th</sup> Intl. Conf. on Spectral Line Shapes, Berkley, CA, June 4, 2002. Invited.

Cormier, J.G., “***Accurate Water Vapor Continuum Absorption Coefficients Obtained using Cavity Ring-Down Spectroscopy,***” NATO Advanced Research Workshop, Fonterraud, France, April 30, 2002. Invited.

Espina, P. I., “***SIM Metrology Working Group for Flow and Related Quantities,***” MSC, Anaheim, CA, January 25, 2002. Invited.

Espina, P. I., “***WGFF Air Flow (Low Pressure),***” 3<sup>rd</sup> WGFF Meeting, Arlington, VA, April 11, 2002. Invited.

Espina, P. I., “***Retos que Enfrenta la Comunidad Metrológica Internacional en Materia de Medición de Flujo de Fluidos,***” Primer Seminario Latinoamericano de Medición de Flujo de Hidrocarburos, Querétaro, Mexico, May 27, 2002. Invited.

Espina, P. I., “***Round-Robin Testing Project to Review the Performance of North American Meter Calibration Facilities,***” CEESI, Ventura, IA, June 12, 2002. Invited.

Hodges, J.T., “***Development of a Frequency-Locked Cavity Ring-Down Spectroscopy System for Measurements of Trace H<sub>2</sub>O,***” George Washington University Chemistry Seminar, Washington, DC, November 2, 2001. Invited.

Hodges, J.T., “***Single-Mode Cavity Ring-Down Spectroscopy of Trace H<sub>2</sub>O in High-Purity Gases,***” Pittcon 2002, New Orleans, LA, March 18, 2002.

Hodges, J.T., “***Measurement of H<sub>2</sub>O Concentration in High-Purity Process Gases using Single-Mode Cavity Ring-Down Spectroscopy,***” Semicon West 2002, San Francisco, CA, July 23, 2002.

Huang, P.H., “***Repeatability and Reproducibility Uncertainty in the Measurement of Trace Moisture Generated by Permeation Tubes,***” 4<sup>th</sup> Intl. Symposium on Humidity and Moisture, Taipei, Taiwan, September 16, 2002.

Huang, P.H., “***The Moisture Content of the Air in Equilibrium with Certain Desiccants,***” 4<sup>th</sup> Intl. Symposium on Humidity and Moisture, Taipei, Taiwan, September 18, 2002.

Huang, T.H., Cavicchi, R.E., and Tarlov, M.J., “***Surface Immobilized DNA Probes on Silicon Microhotplates and Their Applications in DNA Analysis,***” Minisymposium on NIST Research in the Biological Sciences, Gaithersburg, MD, November, 7, 2001. Invited.

Hurly, J.J., “***Thermophysical Properties of Helium from Theory: A New Standard,?***” AICHE Annual Meeting, Reno, NV, November 7, 2001.

Hurst, W.S., “***NIST Intensity Standards for Raman Spectroscopy,***” Intl. Forum for Process Analytical Chemistry (IFPAC), San Diego, CA, January 25, 2002. Invited.

Hurst, W.S., “***In Situ Raman Spectroscopic Investigation of Corrosion of Selected Metals and***

***Alloys Under Hydrothermal Conditions,***” 5<sup>th</sup> Intl. Conf. on Solvothermal Reactions, East Brunswick, NJ, July 23, 2002. Invited.

Johnson, A. N., ***“Temperature Characterization of the 25.9 m<sup>3</sup> PVTt Primary Standard,”*** 5<sup>th</sup> Intl. Symposium on Fluid Flow Measurement (5<sup>th</sup> ISFFM), Arlington, VA, April 9, 2002.

Kreider, K.G., ***“Wafer Emissivity Effects on Lightpipe Radiometry in RTP,”*** 201<sup>st</sup> Electrochemical Society Meeting, Philadelphia, PA, June 15, 2002.

Kreider, K.G., ***“Application of Thermocouple Wafers in RTP Temperature Measurements,”*** 10<sup>th</sup> Intl. Conf. on Advanced Thermal Processing of Semiconductors, Vancouver, Canada, September 26, 2002.

Maslar, J.E., ***“Structural Characterization of Homoepitaxial Gan Layers Using Raman Spectroscopy,”*** Intl. Workshop on Bulk Nitride Semiconductors, Amazonas, Brazil, May 22, 2002.

Maslar, J.E., ***“In Situ Characterization of Gas-Phase Nucleated Silicon Particles Formed via Silance Pyrolysis in a Thermal Chemical Vapor Deposition Reactor,”*** Nanoparticles and Nanostructure through Vapor Phase Synthesis Conference, Pascoli, Italy, June 19, 2002.

Maslar, J.E., ***“Some NIST Efforts in Support of Advanced IC Interconnect Development,”*** University of Maryland, College Park, MD, July 17, 2002. Invited.

Maslar, J.E., ***“In Situ Raman Spectroscopic Investigation of Corrosion of Selected Metals and Alloys Under Hydrothermal Conditions,”*** Seoul National University, Seoul, Korea, August 22, 2002. Invited.

Maslar, J.E., ***“Non-Contact Determination of Free Carrier Concentration in N-Type GaSb and GaInAsSb,”*** 5<sup>th</sup> Intl. Conf. on Mid-Infrared Optoelectronic Materials and Devices, Annapolis, MD, September 9, 2002.

Mattingly, G.E., ***“CIPM Working Group for Fluid Flow-Plans & Progress,”*** Measurement Science Conference, Anaheim, CA, January 25, 2002. Invited.

Mattingly, G.E., ***“Flow Measurement Key Comparisons: Statistical Design & Analysis Basis for Multiple-Meter Transfer Standards,”*** Measurement Science Conference, Anaheim, CA, January 25, 2002.

Mattingly, G.E., ***“CIPM Working Group for Fluid Flow-Key Comparison Plans,”*** EUROMET Flow Measurement Committee Annual Meeting, Poitier, France, March 7, 2002. Invited.

Mattingly, G.E., ***“CIPM Working Group for Fluid Flow-Plans & Progress,”*** 5<sup>th</sup> Intl. Symposium on Fluid Flow Measurement, Washington, DC, April 8, 2002. Invited.

Mattingly, G.E., ***“Flow Measurement Proficiency Testing for Establishing Traceability to National Flow Standards,”*** DoE Workshop on Instruments, Controls, and Human-Machine Interface, Gaithersburg, MD, May 16, 2002. Invited.

Mattingly, G.E., ***“CIPM Working Group for Fluid Flow-Key Comparison Plans and Status,”***

Consultative Committee for Mass and Related Quantities (CCM) Meeting, BIPM, Paris, France, May 23, 2002.

Mattingly, G.E., ***“CIPM Working Group for Fluid Flow: Plans, Progress and Reactions from BIPM,”*** Pigar Ruhrgas, Dorster, Germany, May 28, 2002. Invited.

Meyer, C.W., ***“Remote Temperature Measurements of Very Small Surfaces using Phosphor Crystals,”*** ASTM E20 Meeting, Dallas, TX, November 5, 2002. Invited.

Miiller, A.P., ***“Overview of Two CCM Key Comparisons in Low Pressure (1 – 1000 Pa) – How Good are MEMS Sensors as Transfer Standards?”*** 48<sup>th</sup> IVC/AVS Intl. Symposium, San Francisco, CA, November 1, 2001.

Miiller, A.P., ***“Key Comparisons CCM.P-K4 and CCM.P-K5 of Pressure Standards in the Range 1 Pa – 1000 Pa,”*** BIPM, Sevres, France, May 21, 2002.

Moldover, M.R., ***“Acoustic Resonators for Measuring the Thermodynamic and Transport Properties of Process Gases and for Calibrating Thermometers,”*** 142<sup>nd</sup> Meeting of the Acoustical Society of America, Ft. Lauderdale, FL, December 3, 2001. Invited

Olson, D. and Kobata, T., ***“Automating the Calibration of Two Piston Gage Pressure Balances,”*** National Conference of Standards Laboratories Intl. (NCSLI) Conference, San Diego, CA, August 7, 2002.

Pipino, A. C. R., ***“Ultra-High-Q Minicavity Chemical Sensors,”*** SPIE Photonic West, San Jose, CA, January 23, 2002. Invited.

Pipino, A. C. R. , ***“Chemical Sensing With Miniature High-Finesse Optical Resonators,”*** Spectroscopy Society of Pittsburgh, Duquesne University, PA, March 20, 2002. Invited.

Pipino, A. C. R., ***“Evanescent Wave Cavity Ring-Down Spectroscopy,”*** Georgetown University, Dept. of Chemistry, Washington, DC, March 12, 2002. Invited.

Pipino, A. C. R., ***“Evanescent Wave Cavity Ring-Down Spectroscopy,”*** Pittcon, New Orleans, LA, March 22, 2002. Invited.

Presser, C., Widmann, J.F., DesJardin, P.E., and Gritzko, L.A., ***“Measurement and Numerical Prediction of Homogeneous Turbulent Flow over a Cylinder: A Baseline for Droplet-Laden Flow Studies,”*** 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 16, 2002.

Presser, C., ***“Liquid Agent Dispersal Around Solid Obstacles,”*** 12<sup>th</sup> Halon Options Technical Working Conference (HOTWC-2002), Albuquerque, NM, May 1, 2002.

Ripple, D.C., ***“Progress in Primary Acoustic Thermometry at NIST: 273K to 505K,”*** NCSLI 2002 Workshop and Symposium, San Diego, CA, August 6, 2002.

Ross, D.J., ***“Temperature Gradient Focusing,”*** Labautomation 2002, Palm Springs, CA, January 29, 2002. Invited.

Ross, D.J., ***“Temperature Measurement and Control in Microfluidic Systems,”*** Micro Total Analysis Systems 2001, October 23, 2001.

Ross, D.J., ***“Temperature Gradient Focusing,”*** SmallTalk 2002, San Diego, CA, July 29, 2002.

Savage, N.O., Gillen, G., Tarlov, M.J., Cavicchi, R.E., Semancik, S., ***“Organosilane-templated Deposition of Metal Oxide Sensing Films on Microhotplates,”*** 9th Intl. Meeting on Chemical Sensors, Boston, MA, July 7-10, 2002.

Scace, G.E., ***“Using Saturator-Based Primary Trace Humidity Standards to Calibrate Water Permeation Tubes,”*** Pittcon 2002, New Orleans, LA, March 18, 2002.

Semancik, S., ***“Application-Tunable Microsensors: Multicomponent Research for New Measurement Technology,”*** 48<sup>th</sup> Intl. Symposium of the American Vacuum Society and 11<sup>th</sup> Intl. Conference on Solid Surfaces,” San Francisco, CA, October 28, 2001.

Semancik, S., ***“Micromachined Arrays as Sensor Platforms and Materials Research Tools,”*** 3<sup>rd</sup> Intl. Aviation Security Technology Symposium, Atlantic City, NJ, November 28, 2001.

Semancik, S., ***“Development of MEMS-Based Microsensors for Chemical Agents,”*** 16<sup>th</sup> Intl. Forum for Process Analytical Chemistry (IFPAC), San Diego, CA, January 23, 2002.

Semancik, S., ***“The Use of Micromachined Arrays for Efficient Materials Processing/Performance Studies,”*** 4<sup>th</sup> Intl. Symposium on Combinatorial Approaches for New Materials Discovery, San Diego, CA, January 24, 2002.

Semancik, S., ***“The Use of MEMS Devices for Chemical Sensor Research,”*** Chemistry Colloquium, Naval Research Laboratory, Washington, DC, March 14, 2002.

Semancik, S., ***“Development of Thin Film MEMS Microsensors for Detecting Chemical Hazards,”*** American Vacuum Soc. Topical Conf. of Understanding & Operating in Threat Environments,” Monterey, CA, May 2, 2002.

Semancik, S., ***“Nanostructured Films for Chemical Sensing,”*** NIST Nanotechnology Open House, Gaithersburg, MD, June 20, 2002.

Semancik, S., ***“MEMS Device Platforms for Efficient Screening and Optimization of Sensing Film Microstructure,”*** 9<sup>th</sup> Intl. Mtg. On Chemical Sensors, Boston, MA, July 9, 2002.

Sobolewski, M.A., ***“Ion Energy Distributions in RF-Biased, High-Density Discharges in CF<sub>4</sub>,”*** 54<sup>th</sup> Annual Gaseous Electronics Conference, University Park, PA, October 12, 2001.

Sobolewski, M.A., ***“Measurements and Models of Ion Energy Distributions in High-Density, Radio-Frequency-Biased CF<sub>4</sub>/Ar Discharges,”*** American Vacuum Society 48th Intl. Symposium, San Francisco, CA, October 30, 2001.

Sobolewski, M.A., ***“Measurements and Models of Ion Energy Distributions in High-Density, Radio-Frequency-Biased CF<sub>4</sub> Discharges,”*** 4th Intl. Workshop on Fluorocarbon Plasmas, Grenoble, France, March 20, 2002.

Sobolewski, M.A., ***“Is There an Optimal Frequency for RF Substrate Bias in High-Density Plasma Reactors,”*** Plasma Etch Users Group of the Northern California Chapter of the American Vacuum Society, Santa Clara, CA, May 9, 2002. Invited.

Sobolewski, M.A., ***“Using Radio-Frequency Electrical Measurements as Plasma Diagnostic,”*** 29th Intl. Conference on Plasma Science, Banff, Canada, May 29, 2002.

Steffens, K.L., ***“Investigations in Fluorocarbon Plasmas using Planar Laser-Induced Fluorescence,”*** 54<sup>th</sup> Annual Gaseous Electronics Conference, University Park, PA, October 11, 2001. Invited.

Strouse, G.F., ***“Traceability,”*** ASTM E20 Meeting, Dallas, TX, November 5, 2002. Invited.

Tarlov, M.J., ***“DNA Immobilized in Two and Three Dimensions,”*** Department of Chemical Engineering, Columbia University, New York, NY, November 13, 2001.

Tarlov, M.J., ***“DNA Microdiagnostics,”*** Gordon Research Conference on Chemistry at Interfaces, Connecticut College, New London, CT, July 8, 2002.

Thomas, G., ***“Capillary and Microdevice Electrophoretic Tools for Genetic Analyses,”*** Morgan State University, Baltimore, MD, March 1, 2002. Invited.

Thomas, G., ***“A Chemist’s Role in the Human Genome Project,”*** Southern University College of Sciences, Dept. of Chemistry, Baton Rouge, LA, March 21, 2002. Invited.

van Zee, R.D., ***“Moletronics for Metrologists II: One Year’s Progress,”*** DARPA Moletronics Meeting, Chandler, AZ, January 15, 2002. Invited.

Whetstone, J.R. ***“Chemical Sensing with Microsensor Arrays,”*** 16<sup>th</sup> Intl. Forum for Process Analytical Chemistry (IFPAC), San Diego, CA, January 22, 2002.

Whetstone, J.R., ***“Thermodynamic Measurement Standards at NIST,”*** INEN, Quito, Ecuador, February 6, 2002.

Wright, J. D., ***“Piston Prover Gas Flow Standards in the NIST Fluid Flow Group,”*** LNE Gas Metrology Symposium, France, September 26, 2001 (delivered by R. Berg). Invited.

Wright, J. D., ***“Comparison of Gas Flow Standards: NMIJ and the NIST Fluid Flow Group,”*** LNE Gas Metrology Symposium, France, September 26, 2001 (delivered by R. Berg). Invited.

Wright, J. D., ***“Progress Report on a New Primary Gas Flow Standard for 1 SLM to 2000 SLM,”*** LNE Gas Metrology Symposium, France, September 26, 2001 (delivered by R. Berg). Invited.

Wright, J. D., ***“Gas Flow Measurement in the NIST Fluid Flow Group,”*** NIST Gas Metrology Group, Analytical Chemistry Division, Chemical Science and Technology Laboratory, NIST, Gaithersburg, MD, December 7 2001. Invited.

Wright, J. D., "***A Primary Gas Flow Standard for 1 SLM to 2000 SLM,***" 5<sup>th</sup> International Symposium on Fluid Flow Measurement (5<sup>th</sup> ISFFM), Arlington, VA, April 9, 2002.

Yeh, T.T., "***Error Free Liquid Flow Diverters for Calibration Facilities,***" 2002 Fluids Engineering Division Summer Meeting, ASME, Montreal, Canada, July 12, 2002.

Zangmeister, C., "***Chemistry of Alkali Halide and Ice Surfaces: Characterization of Reactions Relevant to Atmospheric Chemistry,***" ACS Annual Conference on Surface and Colloid Chemistry, Ann Arbor, MI, June 24, 2002. Invited.

### **3. Cooperative Research and Development Agreements (CRADAs) and Consortia**

Research and Development in Advanced Semiconductor Manufacturing Technology, K.G. Kreider

**International SEMATECH, Inc. (Consortia)**



#### **4. Patent Awards and Applications**

Locascio, L.E., Ross, D.J., Tarlov, M.J., and Barker, S.L.R., “Polyelectrolyte Derivatization of Microfluidic Devices,” (NIST Docket No. 00-031, Patent Pending)

Johnson, T.J., Waddell, E.A., Ross, D.J., Locascio, L.E., “Surface Charge Modification Within Preformed Microchannels to Modulate Flow and Fabrication of Microarrays by Laser Ablation in Performed Polymer Microchannels,” (NIST Docket No. 01-005 and 01-006, Patent Pending)

Johnson, T.J., Ross, D.J., and Locascio, L.E., “Microfluidic Flow Manipulation Device,” (Non-Provisional Application Filed)

Pipino, A.C.R., “Sensitive and Selective Chemical Sensor with Nanostructured Surfaces,” (NIST Docket No. 01-001, U.S. Provisional Patent Application Serial No. 60,260,501, Patent Pending)

Pipino, A.C.R., Hodges, J.T., “Sensitive and Selective Biosensor Employing Nanostructured Surfaces,” (NIST Docket No. 01-002, Patent Pending)

Ross, D.J., Locascio, L.E., “Simplified Methods for Electrokinetic Focusing in Microfluidic Devices,” (NIST Docket No. 01-029, Patent Pending)

Tarlov, M.J., Ross, D.J., and Olsen, K.E., “Bio-Affinity Gel Plugs in Microfluidic Channels,” (NIST Docket No. 02-004, Non-Provisional Application Filed)

Thomas, O., Cavicchi, R.E., and Tarlov, M.J., “Fast Transient Microscale Heating for Chemical and Biochemical Detection,” NIST Docket No. 02-006PA, Provisional Application Filed)

Zangmeister, C.D., van Zee, R.D., “Selective Electroless Attachment of Contacts to Electrochemically-Active Molecules,” (NIST Docket No. 02-008, Provisional Application Filed).

## **5. SRM Activities**

2241 Relative Intensity Correction Standard for Raman Spectroscopy: 785 nm Excitation  
(completed)

## **6. SRD Activities**

None.

## 7. Calibrations/Special Tests

Abbott Laboratories  
Accurate Calibration Inc.  
Agilent Technologies  
Air Products & Chemicals Inc.  
Alcan International Limited  
Alcatel Vacuum Products, INC.  
Alcoa Inc.  
Alstom Power Inc.  
AppMet Inc.  
ARi Industries Inc.  
Arizona Public Service Company  
Arnold AFB  
ASL, Inc.  
AW Company, Ltd.  
Barber-Colman Company  
Baxter Healthcare Corporation  
Bechtel BWXT Idaho, LLC  
Bechtel SAIC Company, LLC  
Bionetics/AFPSL  
Bios  
Boeing Commercial Airplane Group  
Boeing Company  
Boeing North American, Inc.  
Brooklyn Thermometer Company Inc  
Burns Engineering, Inc.  
BWXT Y-12, L.L.C.  
Cal-Corr Services & Repairs  
Calvert Cliffs Nuclear  
Carpenter Specialty Alloys  
Casade Regional Blood Services  
Chandler Engineering  
CI Systems Ltd.  
City of Tacoma Environmental Services  
Cleveland Electric Laboratories  
Climatronics Corporation  
Clinton Power Station  
Conax Buffalo Technologies LLC  
Conrad Kacsik Instrument Systems, Inc.  
Consumers Energy  
Control Solutions Ltd., LLC  
Department of Agriculture  
Detroit Edison  
DH Instruments  
DHHS/FDA/CDRH/OSM  
Drift River / WFR Metering  
Duke Energy Corporation  
Duke Engineering & Services  
Duro-Sense Corp  
Eastman Kodak Company  
Emerson Electric Company  
Energy Northwest  
Engelhard-Clal  
Environmental Systems Corp.  
EVCO Technology  
Ever Ready Thermometer Co. Inc  
Exelon Energy Company  
FL Dept of Environ. Protection  
Fleming Associates, Inc.  
Flow Technology, Inc.  
FMC Energy Systems  
Furnace Parts, LLC  
G & G Metering Services Ltd.  
GE Industrial Systems  
General Eastern Instruments  
Geocorp Industrial Controls  
Granville-Phillips Helix Technology Corp.  
Grotto Incorporated  
Hart Scientific, Inc.  
Henry Troemner LLC  
HERMetic, Inc.  
Honeywell  
Honeywell FM&T  
Honeywell Inc.,SGP  
Howmet Corporation  
ICL Calibration Laboratories, Inc  
IES A Kele Company  
Istituto Politecnico  
Intech Automation Systems Corporation  
InterMet Systems  
Intersil  
Isotech  
Jim Beam Brands Company  
JMS Southeast, Incorporated  
Johnson Gage & Inspection, Inc.  
Johnson Matthey  
Kahn Companies  
Kaman Aerospace Corporation  
Kanomax USA, Inc.

Kanthal  
Kelly Completion Services LLC  
Krum International Corp  
Kulas Systems Inc.  
Kurz Instrument, Inc.  
LDS Vacuum Products, Inc.  
Leico Industries Inc.  
Liquid Measurement & Controls, Inc.  
Lockheed Martin Aeronautics Company  
Lockheed Martin Astronautics  
Lockheed Martin Corporation  
Marine Corps Logistics Base  
Marlin Manufacturing Corp.  
McDonnell Douglas Corporation  
Medi-Flex Hospital Products, Inc.  
MEECO, Inc.  
Meter Engineers, Inc.  
Middle River Aircraft Systems  
Miller Wire & Cable  
MillerTech Instrument Corp  
Millipore Corporation  
Minnesota Department of Public Safety  
Mississippi Space Services  
MJ Research, Inc.  
MKS Instruments, Inc.  
Modern Instrument Co. Inc.  
Motion Industries Inc.  
MVM Enterprises  
Mykrolis Corp  
Mykrolis Corporation  
NASA/Kennedy Space Center  
National Research Council Canada  
Naval Air Weapons Station  
Naval Surface Warfare Center  
Navy Aviation Depot, North Island  
Navy Primary Standards Laboratory  
Navy Standards Laboratory  
Nebraska Health System  
Newport News Shipbuilding  
NH Dept of Agriculture  
Omega Engineering, Inc.  
OSHA  
P&W CT. Cal-UTC SBS  
Pemberton Fabricators Inc  
Pennsylvania Power & Light Company  
Philip Morris USA  
Philip Services Corp.  
Pond Engineering, Inc.  
PPL Susquehanna, LLC  
Pratt & Whitney (The Bernd Group, Inc.)  
Precision Surveillance Corp.  
Pressurements Limited  
Primary Standards North America Inc.  
Production Systems Inc.  
Pyco Inc.  
Pyromation, Inc.  
Pyrometric Service Company  
Raytheon Company  
RH Systems  
Rice Lake Weighting Systems  
Rolock of California, Inc.  
Rosemount Aerospace, Inc.  
Rothe Joint Venture LP  
Sandelius Instruments, Inc.  
Sandia National Laboratories  
Santa Barbara Infrared, Inc.  
Sensing Devices, Inc.  
Smith Systems Operation  
South Carolina Electric & Gas Co.  
Southern California Edison Co.  
Special Metals Corporation  
Spectrodyne Inc  
Stanford Research Systems  
State of Florida  
Stillings Instrument Systems Company  
Teledyne Electronic Technologies -  
Hastings  
Tennessee Valley Authority  
TEW America, Inc.  
Thermo Electric Wire & Cable L.L.C.  
Thermodynamic Sensors  
Thermometrics  
Thunder Scientific Corp.  
Tiger Optics LLC  
Tobacco Industry Testing Lab  
TRANSCAT  
TRW Space & Electronics  
US Army Aviation and Missile Command  
US Army TMDE Support-Region 1  
US Geological Survey  
Vacuum Technology Incorporated  
Vaisala Inc.

Varian Vacuum Technologies  
Verizon  
Watlow  
Watson Cogeneration Company

Willson Scientific Glass, Inc.  
Wyeth-Ayerst Pharmaceuticals  
Wyle Laboratories

## **8. Committee Assignments**

### **P.J. Abbott**

AVS Recommended Practices Standards Committee  
AVS Recommended Practices Subcommittee on Ionization Gauge Calibration  
CIPM C002 Consultative Committee on Mass and Related Quantities  
SC.04 Low Pressure

### **M.J. Carrier**

NIST Information Technology Services Planning Team

### **R.E. Cavicchi**

NIST Research Advisory Committee

### **R.W. Davis**

Combustion Institute Program Review Subcommittee

### **R.G. Driver**

CSTL Diversity Committee  
NCSL Intrinsic and Derived Standards Committee, Deadweight Pressure Gauges

### **P.I. Espina**

CIPM Consultative Committee on Mass and Related Quantities  
WG Fluid Flow, Delegate  
Gas Technology Institute MTAG  
SIM TWG10 Flow and Related Quantities  
NORAMET TC: Mechanical Area  
ISA Flow Technology Committee

### **K.M. Garrity**

ASTM E020 Temperature Measurement  
SC.04 Thermocouples

### **K.A. Gillis**

NIST Information Technology Services Planning Team  
NIST Scientific Computing Working Group

### **P.H. Huang**

ASTM D022 Sampling and Analysis of Atmospheres  
SC.09 ISO Tag for ISO/TC146 (Air Quality)  
SC.11 Meteorology  
CIPM International Committee on Weights and Measures  
CCT Consultative Committee on Thermometry  
WG.06 Humidity Measurements and Standards, Chair  
SEMI C012 Test Methods and Recommended Practices  
SC.02 Gases/Semiconductor

WG.02 Moisture Measurements in Gases

**J.J. Hurly**

SEMI C012 Gases  
SEMI C014 Facilities

**W.S. Hurst**

ASTM E013 Molecular Spectroscopy  
SC.08 Raman Spectroscopy

**K.G. Kreider**

ASTM E020 Temperature Measurement  
SC.02 Radiation Thermometry  
SC.04 Thermocouples

**A. Lee**

CIPM C002 Consultative Committee on Mass and Related Quantities  
SC.02 High Pressure  
SC.04 Low Pressure  
SC.06 Medium Pressure  
Combustion Institute, 27<sup>th</sup> Symposium (International) on Combustion, Program Review Subcommittee  
NIST Diversity Advisory Board  
CSTL Diversity Committee, Chair

**J.P. Looney**

AVS Vacuum Technology Division Executive Committee  
AVS Recommended Practices Committee on Spinning Rotor Gages  
CIPM C002 Consultative Committee on Mass and Related Quantities  
SC.04 Low Pressure

**G.E. Mattingly**

ASME C008 Measurement of Fluid Flow in Closed Conduits  
SC.06 Glossary of Terms for Flow Measurements  
SC.14 Flow Measurement by Weighing and Volumetric Techniques, Chair  
SC.15 Installation Effects  
SC.16 Vortex Shedding Flow Meters  
SC.19 Flow Conditioning  
SC.22 Critical Flow Meters  
SC.23 Small Bore Orifice Meters  
CIPM C002 Consultative Committee on Mass and Related Quantities  
WG.09 Fluid Flow, Chair  
IMEKO TC-09 Flow Measurement  
US TAG for ISO/TC30 Measurement of Fluids Committee



**C.W. Meyer**

ASTM E020 Temperature Measurement  
CIPM International Committee on Weights and Measures  
CCT Consultative Committee on Thermometry  
WG.03 Uncertainties

**A.P. Müller**

ASTM E037 Thermal Measurements  
SC.01 Test Methods and Recommended Practices  
WG.17 DSC Calibration  
AVS Recommended Practices Subcommittee on Thermal Conductivity Gauging  
AVS C0009 Low Pressure Gauges  
CIPM C002 Consultative Committee on Mass and Related Quantities  
SC.02 High Pressure  
SC.04 Low Pressure, Chairman  
SC.06 Medium Pressure

**M.R. Moldover**

NASA Review Panel, Fluid Dynamics Discipline Working Group  
NASA Review Panel, Fundamental Processes Discipline Working Group  
CIPM International Committee on Weights and Measures  
CCT Consultative Committee on Thermometry  
WG.04 Thermodynamic Temperature Determination and Extension of ITS-90 to  
Lower Temperatures

**D. Olson**

CIPM C002 Consultative Committee on Mass and Related Quantities  
SC.02 High Pressure  
NCSL Intrinsic and Derived Standards Committee, Deadweight Pressure Gauges

**C. Presser**

AIAA Terrestrial Energy Systems Technical Committee  
AIAA Computational Fluid Dynamics Committee on Standards  
ASME HTD Committee on Heat Transfer in Energy Systems  
ASME FACT Committee for Academic and Industrial Research  
ASTM E029 Particle Size Measurement  
SC.03 International Cooperation on Terminology, Standards, and Methods  
SC.04 Liquid Particle Measurement  
SC.05 Reference Materials  
Combustion Institute Program Review Subcommittee  
ILASS Diesel and Automatic Spray Technical Committee  
ILASS Computation and Modeling Technical Committee  
JANAF Interagency Propulsion Committee, Modeling and Simulation Subcommittee

**D.C. Ripple**

ASME C019 Performance Test Codes

SC.03 Temperature Measurement, Chair  
ASTM E020 Temperature Measurement  
SC.04 Thermocouples, Secretary  
CIPM International Committee on Weights and Measures  
CCT Consultative Committee on Thermometry  
WG.01 International Traceability in Temperature Measurements, Chair

**J.W. Schmidt**

NCSL 144 Intrinsic and Derived Standards  
SC.01 Consensus Standards Committee on Dead-Weight Pressure Gauges

**S. Semancik**

Program Committee, 9<sup>th</sup> International Meeting on Chemical Sensors

**G.F. Strouse**

ASTM E020 Temperature Measurement  
SC.03 Resistance Thermometers  
SC.06 New Thermometers and Techniques  
SC.07 Fundamentals in Thermometry  
CIPM International Committee on Weights and Measures  
CCT Consultative Committee on Thermometry  
WG.07 Key Comparisons  
SIM InterAmerican System of Metrology  
TC Technical Committee  
MWG3 Temperature, Chair

**M.J. Tarlov**

AVS Biochemical Interfaces Steering Committee  
CSTL Colloquium Committee

**W.L. Tew**

ASTM E020 Temperature Measurement  
SC.03 Resistance Thermometers  
SC.06 New Thermometers and Techniques  
SC.07 Fundamentals in Thermometry  
IEC TC065 Industrial Process Measurement and Control  
SC65B Elements of Systems  
WG05 Temperature Sensors

**C.D. Vaughn**

ASTM E020 Temperature Measurement  
SC.05 Liquid-in-Glass Thermometers and Hydrometers, Secretary

**J.R. Whetstone**

ISA C002 Standards and Practices Board

**T.T. Yeh**  
ASME MFC Subcommittee 9, Ultrasonic Flowmeters

## **9. Editorships**

**R. D. van Zee and J.P. Looney**

Cavity-Enhanced Spectroscopies, Vol. 40, Experimental Methods in the Physical Sciences, Academic Press, Boston, MA (2002).

## **10. Seminars**

### **October 24, 2001**

Steve Allison, Oak Ridge National Laboratory, Knoxville, TN

“Non-Contact Thermometry Based on Fluorescence” (Division Sponsor: C. Meyer)

### **November 27, 2001**

Tom Avedisian, Sibley School of Mechanical & Aerospace Engineering, Cornell University, Ithaca, NY

“Bubble Nucleation in Thermal Ink Jet Printers” (Division Sponsor: C. Presser)

### **December 18, 2001**

Tim Johnson, NIST Microfluidics Group (839.04)

“Passive Fluid Manipulation Within Microfluidic Devices” (Division Sponsor: M. Tarlov)

### **March 26, 2002**

Sara Brazill, Dept. of Chemistry, University of California, Riverside, CA

“The Implementation of a Frequency Based Electrochemical Detection System for the Analysis of Biomolecules” (Division Sponsor: M. Tarlov)

### **June 11, 2002**

Jeremiah Mbindyo, Pennsylvania State University, Pittsburgh, PA

“Metal Nanowires: Nanoscale Interfaces for Engineering Nanoscale Electronic Devices and Sensors” (Division Sponsor: S. Semancik)

### **June 13, 2002**

Jeremy Pietron, Naval Research Laboratory, Washington, DC

“Using Three Dimensions in Nanostructured Mesoporous Catalysts” (Division Sponsor: S. Semancik)

### **July 19, 2002**

Corinne Lengsfeld, University of Denver, Denver, CO

“Manipulating Poly (*l*-lactic acid) Particle Size Using Gas-Like Mixing in the Precipitation with a Compressed Antisolvent Process” (Division Sponsors: A. Lee & C. Presser)

### **August 1, 2002**

Frank Pfefferkorn, Purdue University,

“Laser-Assisted Machining of Zirconia Ceramics” (Division Sponsor: S. Semancik)

### **August 8, 2002**

Dimitri Routkevitch, Nanomaterials Research LLC, Longmont CO

“Robust Ceramic Gas Microsensor Platform from Anodic Alumina” (Division Sponsor: S. Semancik)

**August 27, 2002**

Eric May, University of Western Australia, Perth, Australia

“An Improved Microwave Apparatus for Phase Behavior Measurements in Lean Gas Condensate Fluids” (Division Sponsor: M. Moldover)

**August 29, 2002**

Michael Musick, Siloam Technology, LLC, Cincinnati, OH

“Applications of Nanoparticles: New Building Blocks for Materials and Reagents for Bioanalytical Chemistry” (Division Sponsor: S. Semancik)

**September 4, 2002**

Guofeng Li, Georgia Institute of Technology, School of Chemistry & Biochemistry, Atlanta, GA

“Electrochemical Functionalization of Conducting Polymers Towards Chemical Sensing Applications” (Division Sponsor: S. Semancik)

## **11. Conferences/Workshops/Sponsored or Co-Sponsored Sessions**

### **November 15, 2001**

ASME International Mechanical Engineering Congress & Exposition, New York, NY  
(C. Presser)

### **January 16, 2002**

AIAA Aerospace Sciences Meeting, Reno, NV (C. Presser)

### **March 18-22, 2002**

Precision Thermometry Workshop, Gaithersburg, MD (K. Garrity, C. Meyer, K. Kreider, D. Ripple, G. Strouse, W. Tew, C. Vaughn)

### **May 16, 2002**

15<sup>th</sup> Annual Conference on Liquid Atomization and Spray Systems (ILASS Americas '02),  
Madison, WI (C. Presser)

### **August 20-21, 2002**

ITS-90 Fixed-Point Cell Mini-Workshop, Gaithersburg, MD (G. Strouse)