

VITA FOR FRANK C. DE LUCIA

PERSONAL: Birth: June 21, 1943 - St. Paul, Minnesota

EDUCATION: Iowa Wesleyan College, Mt. Pleasant, Iowa, B.S. 1964
Duke University, Durham, NC, Ph.D. Phi Beta Kappa 1969

Frank C. De Lucia is University Professor of Physics at Ohio State University and previously was Professor of Physics at Duke University. He has served both departments as Chairman. He has been associated with the Microwave Laboratory since 1964 and currently serves as its Director. Along with his students and coworkers he has developed many of the basic technologies and systems approaches for the SMM/THz and exploited them for scientific studies. Among his research interests are imaging and phenomenology, remote sensing, the spectroscopy of small, fundamental molecules, SMM/THz techniques, collisional processes and mechanisms, the excitation and study of excited states, molecules of atmospheric and astronomical importance, and analytical chemistry and gas sensing. He belongs to the American Physical Society, the Optical Society of America, the Institute of Electronic and Electrical Engineers, and Phi Beta Kappa. He was awarded the Max Planck Research Prize in Physics and the William F. Meggers Award of the Optical Society of America.

Recent Presentations and Publications

(More than 200 additional papers have been published in the refereed literature)

“Comparison of THz and MMW Imaging,” F. C. De Lucia and D. T. Petkie, Terahertz Sources and Systems for Security Use, Her Majesty’s Government Communications Centre, Grey College, Durham University, September 28-30, 2005.

“Science and Technology in the Submillimeter Spectral Region,” F. C. De Lucia, Optics and Photonics News **14**, 44-50, 2003.

“THz Gas Sensing with Submillimeter Techniques,” F. C. De Lucia and D. T. Petkie, SPIE, Orlando, 2005.

“THz + ‘X’ - A search for new approaches to significant problems,” F. C. De Lucia, D. T. Petkie, R. K. Shelton, S. L. Westcott, and B. N. Strecker, SPIE, Orlando, March 28-29, 2005.

“Science and Technology in the Submillimeter/Terahertz Spectral Region,” F. C. De Lucia, International Microwave Symposium, Long Beach, June 13, 2005.

“Critical Paths to Holy Grails in the THz,” Frank C. De Lucia, Douglas T. Petkie, Joint Terahertz Imaging System Technology Assessment, Falls Church, Va, August 31, 2005.

“Terahertz (Millimeter, Nearmillimeter, Submillimeter, Far Infrared) Science, Technology, and Opportunities, Lawrence Livermore National Laboratory,” F. C. De Lucia, May 19, 2005.

“THz Holy Grails: Opportunities, Challenges, and Critical Paths,” F. C. De Lucia, AMRDEC, Huntsville, 2006.

“Physics Driven Challenges and Opportunities in the Submillimeter/Terahertz Spectral Region,” F. C. De Lucia, GOMACHTech, San Diego, March 20, 2006.

“Experimental Confirmation of Quantum Monodromy: The Millimeter Wave Spectrum of Cyanogen Isothiocyanate NCNCS,” B. P. Winnewisser, M. Winnewisser, I. R. Medvedev, M. Behnke, S. C. Ross, J. Koput and F.C. De Lucia, Phys. Rev. Lett. 95, 243002, 2005.

“Chemical analysis in the submillimetre spectral region with a compact solid state system,” I. R. Medvedev, M. Behnke and F. C. De Lucia, *Analyst* (Cambridge, United Kingdom) 131, 1299-1307, 2006.

“The hidden kernel of molecular quasi-linearity: Quantum monodromy,” M. Winnewisser, B. P. Winnewisser, I. R. Medvedev, S. C. Ross, L. M. Bates, and F. C. De Lucia, *J. Mol. Structure* 798, 1 – 26, 2006.

"An Experimental Approach to the Prediction of Complete Millimeter and Submillimeter Spectra at Astrophysical Temperatures: Applications to Confusion-Limited Astrophysical Observations," I. R. Medvedev and F. C. De Lucia, *ApJ.*, vol. 656, pp. 621-628, 2007.

"Laboratory Measurements of Dry Air Atmospheric Absorption with a Millimeter Wave Cavity Ringdown Spectrometer," A. Meshkov and F. C. De Lucia, *J. Quant. Spectrosc. Rad. Trans.*, vol. 108, pp. 256-276, 2007.

"Active and passive imaging in the THz spectral region: phenomenology, dynamic range, modes, and illumination," D. Petkie, C. Casto, F.C. De Lucia, S. Murrill, Brian Redman, R. Espinola, C. Franck, E. Jacobs, S. Griffin, C. Halford, J. Reynolds, S. O'Brien, D. Tofsted, *J. Opt. Soc. Am. B.*, vol. 25, Pages 1523- 1531, 2008.

Active Research Projects:

NSF: An experimental approach to the prediction of complete millimeter/submillimeter spectra at astrophysical temperatures: application to confusion limited astrophysical observations.

Semiconductor Research Corporation: Millimeter and submillimeter gas sensors: system architectures for CMOS devices.

NASA: Variable temperature, intensity calibrated, complete submillimeter spectra and analysis: a new, efficient solution to the astrophysical confusion limit.

DARPA: Assessment of the Feasibility of MACS Mission Adaptation in Breath Analysis Applications.

ARO: Techniques for SMM/THz chemical analysis: investigations and exploitation of the large molecule limit.

DTRA: A new physical regime for remote sensing in the THz.

NASA: Millimeter and submillimeter spectroscopy of molecules of atmospheric importance.

Jet Propulsion Lab: Herschel Science: A New Approach for the Identification and Elimination of Astrophysical Weeds.

NASA (with E. Herbst): Submillimeter-wave laboratory spectroscopic investigations.

DARPA: A double resonance approach to submillimeter/terahertz molecular remote sensing at atmospheric pressure