



Robert R. Alfano

Distinguished Professor of Science & Engineering
Institute for Ultrafast Spectroscopy and Lasers
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Education

New York University	Ph.D. Physics	1972
Fairleigh Dickenson University	M.S. Physics	1964
Fairleigh Dickenson University	B.S. Physics	1963

Professional Experience

Distinguished Professor of Science and Engineering	City College of N.Y., CUNY	1987 to present
Herbert Kayser Professor of Electrical Engineering	City College of N.Y., CUNY	1983 to 1987
Director, Institute for Ultrafast Spectroscopy and Lasers	City College of N.Y., CUNY	1982 to present
Professor of Physics	City College of N.Y., CUNY	1978 to 1987
Director, Picosecond Laser And Spectroscopy Lab	City College of N.Y., CUNY	1974 to 1978
Associate Professor	City College of N.Y., CUNY	1972 to 1974
Visiting Scientist	GTE Research Labs, Bayside, N.Y	1972 to 1974
Research Physicist	GTE Research Labs, Bayside, N.Y.	1964 to 1972
Honor Research Fellow	Fairleigh Dickinson University	1963 to 1964

Honors

Coherent Award for Lifetime Achievement in Biophotonics (2002), Fellow of Institute of Electronics and Electrical Engineers (2001), Leonardo Da Vinci Award (1991), Fellow of Optical Society of America (1989); Outstanding Italian-American Award for Science (1983); Fellow of American Physical Society (1976); Research Corporation Award (1974); A. P. Sloan Fellow (1974).

Research Interests

Biomedical imaging and spectroscopy, ultrafast lasers and optics, tunable lasers, semiconductor materials and devices, optical materials, biophysics, nonlinear optics and photonics.

Selected Publications (Over 600 in refereed journals)

- *Optical Phonon Lifetime Measured Directly with Picosecond Pulses*, R. R. Alfano and S. L. Shapiro, Phys. Rev. Lett. 26, 1247 (1971).
- *Establishment of a Molecular Vibration Decay Route in Liquid*, R. R. Alfano and S. L. Shapiro, Phys. Rev. Lett. 29, 1655 (1972).
- *Observation of Self-Phase Modulation and Small Scale Filaments in Crystals and Glasses*, R. R. Alfano, and S. L. Shapiro, Phys. Rev. Lett. 24, 592 (1970).
- *Laser Action in Cr-activated Forsterite for Near Infrared Excitation: Is Cr⁴⁺ the Lasing Ion?* V. Petricevic, S. K. Gayen, R. R. Alfano, Appl. Phys. Lett. 53, 2590 (1988).
- *Generation of sub-100-fs Pulses from a CW Mode-locked Chromium-doped Forsterite Laser*, A. Seas, V. Petricevic, R. R. Alfano, Opt. Lett. 17, 937 (1992).
- *Primary Decay Pathway of a Local Mode of a Photoexcited Ion into a Dielectric Crystal Host Lattice*, S. G. Demos, Dana M. Calistru, S. Owen, A. B. Bykov, V. Petricevic, R. R. Alfano, Phys. Rev. Lett. 82, 2556 (1999).
- *Photoluminescent Determination of the Fundamental Gap for the Ferromagnetic Semiconductor CdCr₂Se₄*, S. S. Yao, F. Pellegrino, R. R. Alfano, W. J. Miniscalco, and A. Lempicki, Phys. Rev. Lett. 46, 558 (1981).
- *Laser Induced Fluorescence Spectroscopy from Native Cancerous and Normal Tissue*, R. R. Alfano, D.B. Tata, J. Cordero, P. Tomashefsky, F. W. Longo, and M. A. Alfano, IEEE J. Quant. Elec. QE-20, 1507 (1984).
- *Time-resolved Imaging of Translucent Droplets in Highly Scattering Turbid Media*, R. R. Alfano, X. Liang, L. Wang, P. P. Ho, Science 264, 1913 (1994).
- *Subsurface Tumor Progression investigated by Noninvasive Optical Second Harmonic Tomography*, Y. Guo, H. E. Savage, Feng Liu, S. P. Schantz, P. P. Ho, R. R. Alfano, Proc. Natl. Acad. Sci. 96, 10854 (1999).
- *When does the Diffusion Approximation Fail to Describe Photon Transport in Random Media?* K. M. Yoo, Feng Liu, R. R. Alfano, Phys. Rev. Lett. 64, 2647 May (1990).
- *Time Resolved Coherent and Incoherent Components of Forward Light Scattering in Random Media*, K.M. Yoo, R. R. Alfano, Opt. Lett. 15, 320 (1990).
- *Optical Kerr Effect*, P. P. Ho and R. R. Alfano, Phys. Rev. A20, 2170 (1979).

Selected Patents (84 patents)

- *Picosecond spectrometer using picosecond continuum*, R. R. Alfano and S. L. Shapiro, US Patent #3,782,828 (January 1, 1974).
- *Laser Action in Chromium-doped Forsterite*, V. Petricevic, S. K. Gayen, R. R. Alfano, US Patent #4,932,031 (June 5, 1990).
- *Method and Apparatus for Detecting Cancerous Tissue using Luminescence Excitation Spectra*, R. R. Alfano, US Patent #5,042,494, (August 27, 1991).
- *Ultrafast Optical Imaging of Objects in a Scattering Medium*, R. R. Alfano, P. P. Ho, L. Wang, US Patent #5,371,368, (December 6, 1994).
- *Imaging of Objects Based upon the Polarization or Depolarization of Light*, R. R. Alfano, S. G. Demos, US Patent #5,847,394, (December 8, 1998).
- *Time-resolved diffusion tomographic 2D and 3D imaging in highly scattering turbid media*, R. R. Alfano, W. Cai, S. K. Gayen, US Patent #6,108,576, (August 22, 2000).
- *Non-linear optical tomography of turbid media*, R. R. Alfano, Y. Guo, F. Liu, P. P. Ho, US Patent #6,208,886 B1, (March 27, 2001).

- *Methods of Detecting Cancerous Tissue using Visible Native Luminescence*, R. R. Alfano and M. A. Alfano, #4,930,516 (June 5,1990)

Selected Grants (150 grants totaling over \$44 million)

- Time-resolved and Spectroscopic Three-dimensional Optical Breast Tomography, Army (AMRMC), 2004 to 2007, \$697,863
- Prostate Cancer Detection Using Near Infrared Spectral Polarization Imaging; Army 2001 to 2004, \$536,956
- Tunable High Efficiency Resonant Tunneling GaN/AlGaIn MQW UV Photodetectors, AFOSR 2001 – 2004, \$599,846
- New York State Infotonics Center of Excellence Compact Photonic Explorers, Infotonics Technology Center Inc. 2002-2004, \$1,357,451
- Center for Optical Sensing and Imaging NASA 2003 to 2008, \$5,998,566
- Center for Nanoscale Photonic Emitters and Sensors (CNPES), DoD 2003 to 2008, \$4,000,000