
GAMINI U. SUMANASEKERA

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EDUCATION

- **Indiana University**, Bloomington, IN (Ph.D., 8/95)
 - Major: Experimental Condensed Matter Physics
 - Minor: Mathematical Physics
- **Bowling Green State University**, Bowling Green, OH (M.S., 6/87)
- **University of Sri-Lanka**, Sri-Lanka, (B.S., 6/80)

WORK EXPERIENCE

- **Senior Research Associate**, Pennsylvania State University, University Park, PA (08/99-Present)
Consultant Carbolex Inc., Lexington KY
 - Investigation of Optical properties of Single Wall Carbon Nanotubes (IR to UV)
 - Investigation of Single Wall Carbon Nanotube as a chemical gas sensor
 - Production of Single Wall Carbon Nanotubes using Laser Pyrolysis technique
 - Hydrogen Storage using Single Wall Carbon Nanotubes in collaboration with Honda R & D Americas
 - Set up a lab at Penn State University to perform variety of electrical transport experiments (thermopower, resistivity, I-V, electrochemistry etc.) by designing measurement probes and writing data acquisition programs.
- **Postdoctoral Scholar**, University of Kentucky, Lexington, KY (10/95-08/99)
 - Involved in a project in collaboration with Allied Signals Inc., to Infiltrate thermoelectric materials into synthetic opals using chemical vapor deposition technique for Aerospace uses
 - Studied the thermoelectric properties of high temperature superconductors and patent on this work is pending
 - Investigated the feasibility of Single Wall Carbon nanotubes as a rechargeable battery material with larger capacity by Studying the electrochemical doping of Bisulfate ions and lithium ions into nanotube bundles
 - Investigated the feasibility of nanoparticle based films as Chemical Gas Sensors
 - Gained experience in electronic instrumentation for sensitive transport measurements, designing of ultra high temperature instrumentation, spin-coating, Raman spectroscopy, EDX, TGA, Optical Reflectivity, Electrochemistry, Atomic Absorption Spectroscopy, Rietveld analysis for detailed X-ray data analysis etc.
- **Research Assistant**, Indiana University, Bloomington, IN (1/89-8/95)
 - Investigated quantum localization effects in thin films and multilayers at dc and Microwave frequencies (using a precision a.c bridge and a HP 8510B network analyzer)
 - Investigated dynamical transport properties in modulation doped and gated heterostructures (GaAs/AlGaAS) at Microwave frequencies
 - Investigated superconducting properties in layered systems

- Gained experience in the handling of liquefied gases (He^3 , He^4 , and LN_2), the designing of cryogenic system facilitating a superconducting magnet, the production of high vacuum using diffusion and cryopumps, thin film and multilayer fabrication using planar magnetron sputtering (dc and rf) and thermal evaporation, characterization of samples using X-ray, TEM, SEM, the use of microwave measurement techniques (transmission and reflection)
- Wrote data acquisition and instrument control computer programs in HP BASIC, C, ViewDac, and LabView utilizing IEEE-488 and RS-232 communication protocols.
- **Teaching Assistant**, Indiana University, Bloomington, IN (1/88-8/89)

COMPUTER SKILL

- **Operating Systems:** UNIX, VMS/VAX, MS-DOS, Windows NT, Mac OS
- **Languages:** C++, C, Fortran, HP BASIC
- **Other:** Mathematica and Igor (numerical and symbolic computation software), Visual C++ and Visual Basic for windows programming, Instrument interfacing with Labview, Viewdac, Qbasic etc.

PATENTS

- Thermoelectric materials Based on Intercalated Layered metallic Systems (U.S. Patent #6091014)
- Metallic Nanoscale Fibers from Stable Iodine-Doped carbon Nanotubes (U.S. Patent #6139919)
- Carbon nanotubes: A Thermoelectric Nano-Nose (Invention Disclosure No. 2000-2357)

JOURNAL REVIEWER

- Phys. Rev. Lett. and Phys. Rev. B

PUBLICATIONS

- **G. U. Sumanasekera**, C. K. W. Adu, B. K. Pradhan, and P. C. Eklund, “Carbon Nanotube: a Thermoelectric Nano-Nose”, Submitted to Phys. Rev. Lett., (12/05/00)
- **G. U. Sumanasekera**, C. Adu, and P. C. Eklund, “Effect of Gas Adsorption and Collisions on Electrical Transport in Single-Walled Carbon Nanotubes”, Phys. Rev. Lett., **85**, 1096 (2000)
- A. Claye, S. Rahman, J. E. Fischer, A. Sirenco, **G. U. Sumanasekera**, P. C. Eklund, “In-Situ Raman Scattering Studies on Alkali-Doped Single-Walled Carbon Nanotubes”, accepted for Chem. Phys. Lett.
- S. Bandow, A.M. Rao, **G.U. Sumanasekera**, P.C. Eklund, F. Kokai, K. Takahashi, M. Yudasaka and S. Iijima, “Evidence for anomalously small charge transfer in doped single-wall carbon nanohorn aggregates with Li, K and Br” Appl. Phys. A, **71**, 561 (2000)
- **G. U. Sumanasekera**, A. L. Allen, and P. C. Eklund, “Electrochemical doping of Bundles of Unopened Single Wall Carbon nanotubes”, Mol. Cryst. and liq. Cryst., **340**, 535 (2000)
- **G. U. Sumanasekera**, J. L. Allen, S. L. Fang, and P. C. Eklund, “Electric Transport Properties of Mo_2N Nanoparticle-based Films”, to be submitted to Chemical Sensor and Actuators

- **G. U. Sumanasekera**, L. Grigorian, and P. C. Eklund, “Low Temperature Thermoelectric Power Measurements using Analog Subtraction”, *Measurement Science & Technology*, **11**, 273 (2000)
- **G. U. Sumanasekera**, J. L. Allen, S. L. Fang, A. L. Loper, A. M. Rao, and P. C. Eklund, “Electrochemical Oxidation of Single Wall Carbon Nanotubes in Sulfuric Acid”, *J. Phys. Chem. B*, **103**, 4292 (1999)
- L. Grigorian, **G. U. Sumanasekera**, A. L. Loper, and P. C. Eklund, “Giant Thermopower in Single Wall Carbon Nanotubes”, *Phys. Rev. B*, **60**, R11309 (1999)
- L. Grigorian, K. A. Williams, S. Fang, **G. U. Sumanasekera**, A. L. Loper, E. C. Dickey, S. J. Pennycook, and P. C. Eklund, “Reversible Intercalation of Charged Iodine Chains into Carbon Nanotube Ropes”, *Phys. Rev. Lett.*, **80**, 24, (1998)
- J. L. Allen, L. Grigorian, S. L. Fang, **G. U. Sumanasekera**, A. L. Loper, Y. -S. Chen, J. Chen, R. C. Haddon, and P. C. Eklund, “Single -Wall Carbon Nanotubes from Coal”, *Chem. Phys. Lett.*, **310**, 31 (1999)
- L. Grigorian, **G. U. Sumanasekera**, A. L. Loper, and P. C. Eklund, “Transport properties of alkali-metal-doped single-wall carbon nanotubes”, *Phys. Rev. B*, **58**, R4195, (1998)
- David V. Baxter, **G. U. Sumanasekera**, and John P. Carini, “Transport Anisotropy and Dimensional cross over in Ag/Ge multilayers” , *J. Magn. Mater.*, **156**, 359 (1996)
- L. Grigorian, S. Fang, **G. U. Sumanasekera**, A. M. Rao, L. Schrader, and P. C. Eklund, “Physical Properties of CVD-grown Se-Carbon Films”, *Synthetic Metals*, **87**, 211 (1997)
- **G. U. Sumanasekera**, Bruce D. Williams, David V. Baxter, and John P. Carini, “Effects of weak-localization and superconducting fluctuations on the frequency dependence of the conductivity in copper-semiconductor sandwiches”, *Phys. Rev. B*, **50**, 2606 (1994)
- **G. U. Sumanasekera**, Bruce D. Williams, David V. Baxter, and John P. Carini, “High Frequency Magnetoconductivity of Disordered Copper films”, *Solid State Commun.*, **84**, 941 (1993)
- K. Rajasekharan, R. I. Boughton, Fang-Fang Yin, and **G. Sumanasekera**, “Flux Quantization of Disordered Bismuth”, *Mod. Phys. Lett. B*, **2**, 1039 (1988)

PROCEEDINGS

- David V. Baxter, **G. U. Sumanasekera**, and John P. Carini, “Transport Anisotropy and Dimensional cross over in Ag/Ge multilayers” , *Proceedings in MML(95) conference in Cambridge, U.K.*
- L. Grigorian, **G. U. Sumanasekera**, and P.C Eklund, “Kondo Effect in Single Wall Carbon Nanotubes”, *Proceedings in MRS (98)*
- **G. U. Sumanasekera**, P. C. Eklund, “Anodic Oxidation of SWNTs in Sulfuric Acid”, 10th Annual International conference of Intercalated Compounds, Okazaki, Japan
- **G. U. Sumanasekera**, L. Grigorian, K.A. Williams, and P. C. Eklund, “Electronic Transport Properties of Bi_xTe_y -Infiltrated Synthetic Opals ”, *Proceedings, XVIII International Conference on Thermoelectrics, Nagoya, Japan*
- L. Grigorian, **G. U. Sumanasekera**, and P. C. Eklund, “Transport Properties of Single-Wall Carbon Nanotubes”, *Proceedings, XVIII International Conference on Thermoelectrics, Nagoya, Japan*

- **G. U. Sumanasekera**, L. Grigorian, P. C. Eklund, A. A. Zakhidov, I. I. Khayrullin, R. Baughman, “Thermoelectric properties of Bi infiltrated opa l-Based-Host, Proceedings, XIV International Conference of Thermoelectrics, Baltimore, Maryland

PERSONAL REFERENCES

- Prof. P. C. Eklund : Department of Physics, Pennsylvania State University, University Park, PA 16802, U. S. A., Tel:(814)-865-5233
- Prof. J. P. Carini : Department of Physics, Indiana University, Bloomington, IN 47405, U. S. A., Tel:(812)-855-4359
- Prof. D. V. Baxter : Department of Physics, Indiana University, Bloomington, IN 47405, U. S. A., Tel:(812)-855-8337