Curriculum Vitae

William M. Ash III, Ph.D.
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Largo, FL 33773
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Specializations:

Digital Holography, electro-optics, optics, photonics, biophysics, semiconductor physics, lasers; microelectronics technology, MEMS/NEMS, physics-of-failure, atomic, molecular and optical (AMO) physics

Professional Services:

Formal proposal reviewer
State Grants in Fundamental Research optics, electro-optics and photonics
Department of Scientific Programs
Shota Rustaveli National Science Foundation
1 Aleksidze Str. 0193, Tbilisi, Georgia

Education

5/8/2010 Ph.D. Applied Physics, University of South Florida, Tampa, FL, GPA 3.72
Digital Holography and Microscopy Laboratory,
Dissertation topic: Total Internal Reflection Holographic Microscopy

5/95 MS Applied Physics, The Johns Hopkins University, Baltimore, MD, GPA 3.70
Concentrations in Spacecraft Systems Design and Optics

Awards and Recognition

USF Academy of Inventors - Charter Member, University of South Florida – 8/09

National Science Foundation GEM4, Cellular and Molecular Mechanics with a focus on Enabling Technologies**,** Global Enterprise for Micro-Mechanics and Molecular Medicine, University of Illinois, Urbana – 6/09

Duckwall Graduate Research Fellow, USF – 6/09

Sigma Pi Sigma National Physics Honor Society - 2008

National Science Foundation Integrated Graduate Education and Research Training - Sensory Knowledge-based Interface Science Fellowship (IGERT-SKINS) – 5/07 – 5/09

Space Systems Outstanding Engineer – 1999. Division-level recognition for qualification and insertion of dual-use microcircuit technology

Honeywell Visions Award – 1996. Corporate-level recognition for leadership in Single Process Initiative development

Teaching experience

- Professor, Electronics and Computer Technology, DeVry Univ., Tampa, FL 6/12 to pres
- Science and Mathematics Tutor, WyzAnt Corp, Chicago, IL 2/12 to 9/12
- Physics Instructor - University of South Florida, Tampa, FL Adjunct Faculty
- Physics Instructor – Saint Petersburg College, Tarpon Springs, FL Adjunct Faculty
- Graduate Teaching Assistant, University of South Florida, PHY2048L, Physics undergraduate laboratory (with calculus), 3 sections, Spring 2007

Lectures

School	Course #	Title	# of sections	# of students	Time Period
DVU	ECT114	Digital Fundamentals-FPGA Design	1	4	1/13 - 3/13
DVU	ECT266	Wireless Communications Systems	1	6	7/12 - 9/12
USF	PHY2053	General Physics I (Algebra based)	3	263	5/10 - 7/11
SPC	PHY1053	General Physics I (Algebra based)	1	16	1/11 - 7/11
SPC	PHY1054	General Physics II (Algebra based)	2	19	5/11 –7/11

Laboratories

School	Course #	Title	# of sections	# of students	Time Period
DVU	ECT114	Digital Fundamentals-FPGA Design	1	4	1/13 - 3/13
DVU	ECT266	Wireless Communications Systems	1	6	7/12 - 9/12
SPC	PHY1048L	General Physics I (Algebra based)	3	55	1/11 - 12/11
SPC	PHY1049L	General Physics II (Algebra based)	4	71	1/11 - 7/11
USF	PHY2048L	General Physics I (Calculus based)	3	60	1/07 - 5/07

Physics Tutor – University of South Florida, 2007-2009

Honeywell Technical Education Department, Clearwater, FL

Semiconductor Device Physics (TED41*)* –12 CEU, two courses of instruction delivered, Text - ***Physics of Semiconductor Devices*** by **S. M. Sze**, 1989 & 1990

Electromagnetic Interference and Compatibility Engineering, Lunch and Learn, 2006

Conferences and Papers

Yinglang Wan, Lusheng Fan, Yingfang Zhu, Huaiqing Hao, William M Ash III, Myung K Kim, Wangxi Luo, Xiaohong Fang, "Variable-angle total internal reflection fluorescence microscopy of intact cells of Arabidopsis thaliana", in *Plant Methods*, BioMed Central Ltd, part of Springer Science (2011), PubMed PMID: 21943324, PMC3219692, http://www.plantmethods.com/content/7/1/27

William M. Ash III, David Clark, Chun Min Lo, Myung K. Kim, **"**Quantitative Characterization of Cellular Adhesions with Total Internal Reflection Holographic Microscopy" in *Digital Holography and Three-Dimensional Imaging*, OSA Technical Digest (CD) (Optical Society of America, 2010), paper DTuA4.

W. M. Ash III, L. Krzewina, and M. K. Kim, "Quantitative Phase Characterization of Cellular Adhesion with Total Internal Reflection Holographic Microscopy" in Applied Optics, *Digital Holography and 3-D Imaging* feature issue, Optical Society of America, Appl. Opt. 48, H144-H152 (2009) http://www.opticsinfobase.org/ao/abstract.cfm?URI=ao-48-34-H144

W. M. Ash and M. K. Kim, "Quantitative Phase Imagery with Total Internal Reflection Holographic Microscopy," in *Digital Holography and Three-Dimensional Imaging*, OSA Technical Digest (CD) (Optical Society of America, 2009), paper DTuA4. http://www.opticsinfobase.org/abstract.cfm?URI=DH-2009-DTuA4

Ash, W. M. and Kim, M. K., "Cellular imagery with total internal reflection holographic microscopy" in BIOS2009, (SPIE 2009), 7182-9 http://dx.doi.org/10.1117/12.808029

M. K. Kim and W. M. Ash, "Digital Holography of Total Internal Reflection," in *Coherent Optical Technologies and Applications*, (Optical Society of America, 2008), paper CTuA4. http://www.opticsinfobase.org/abstract.cfm?URI=COTA-2008-CTuA4

Ash, W. M. and Kim, M. K., "Total Internal Reflection Holographic Microscopy," in *Frontiers in Optics*, OSA Technical Digest (CD) (Optical Society of America), paper PDPB1, (2008) http://www.opticsinfobase.org/abstract.cfm?URI=FiO-2008-PDPB1

W. M. Ash and M. K. Kim, "Digital holography of total internal reflection," Opt. Express **16**, 9811-9820 (2008) http://www.opticsinfobase.org/abstract.cfm?URI=oe-16-13-9811

W. M. Ash III and M. K. Kim, "A Demonstration of Total Internal Reflection Holographic Microscopy for the Study of Cellular Motion," in *Digital Holography and Three-Dimensional*

Imaging, OSA Technical Digest (CD) (Optical Society of America, 2008), paper DTuB6. http://www.opticsinfobase.org/abstract.cfm?URI=DH-2008-DTuB6

B. G. Henson, W. Stapor, W. M. Ash et al**, "Energetic Proton Measurement and Analysis on a CID camera to be used in the ERADS Environment"**, *Government Microcircuits Applications Conference (GOMAC)*, 3/2000

W. M. Ash III, **"Assessment of a Large Dual-Use memory device (DRAM) for space flight applications"**, Presented at *Electronics Components for the Commercialization of Military and Space Systems – Radiation Effects Session*, Component Technology Institute, 1999

Session Chairman, *Electronics Components for the Commercialization of Military and Space Systems*, Component Technology Institute (CTI), Inc., 1998

Society Of Logistics Engineers (SOLE) and industry presentations (L-M, MICOM/AMCOM) on the 'High Reliability Application of Dual-Use Plastic Encapsulated Microcircuits', 1995-2000

"Reliability Assessment of Dual-Use Microcircuits", Presented at *Electronics Components for the Commercialization of Military and Space Systems*, San Diego, CA, Component Technology Institute, Inc., 2/1997

W. M. Ash III and E. J. Hoffman,* **"Reliable Application of Plastic Encapsulated Microcircuits for Small Satellites,"** ***Proceedings 8th Annual AIAA/USU Conference on Small Satellites***, Utah State University, Logan, Utah, 8/1994, *AIAA Fellow, Chief Engineer for JHU/APL Space Department (retired).

Patent Awards and Submittals:

6/08	***MOEMS-based Interferometric Optical Bench System*** (U of South FL – 6/09 **PAF**) US PAF 20090316158 Interferometric Chemical Sensor Array 12/09
8/06	***Robotics Application of a Passive Optical Locator*** (Honeywell International)
8/06	***Electronics Imaging and Ranging for a Passive Optical Locator*** (Honeywell Intl)
12/05	***Passive Optical Locator*** US Patent 7518713 (Honeywell International) USPTO 20070103671, 20070103673 and 20070127008

QUALIFICATIONS:

- Applied Physicist with experience spanning the electronics, aerospace and biomedical industries
- 'DC-to-light' experience with highly capable, highly reliable electronics, optics, and hardware

- Results driven process champion / 'Outside-the-box' spiral development / Director-level report
- Extensive experience in servicing sponsors and customers including scientific/NASA, commercial and Tri-Services
- Project Lead Systems Engineer/Program Material Manager with production responsibility through final test and buy-off
- Key pursuit/proposal team member – Implements key technology approaches from capabilities, roles and responsibilities
- Earned Value Management System Control Account Manager (EVMS CAM); Proven performance over $25M

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Industry Employment

5/7/12 to Present — **Senior Engineer,** Belcan Corporation, Cincinnati, OH
Semiconductor Device Physicist
Aerospace Electronics Engineering Consultant
Microelectronics Packaging Specialist
C-Mode Scanning Acoustic Microscopy
New Technology Evaluation for MEMS electronics
Reduction of non-value added processing and test

3/08 – 5/11 — **Technical Consultant,** BNL Largo, Inc., Largo, FL
Optical MEMS engineering, thermal vacuum (10^{-5} Torr) and rate table testing of fiber optic gyroscope (FOG) sensor assemblies, Solar Power Arrays

10/94 - 8/06 — **Lead Systems Staff Engineer**, HONEYWELL DSES, Clearwater, FL
Lead Systems Engineer for P81 Command, Telemetry & Control Unit Engineering Model (CTCU EM) design, development and production (CAM $2M). Systems engineering for P81 satellite enhanced Control Electronics Assembly, Pendulous Integrating Gyroscope Test System and various flight proposals. Radiation Effects team lead for Commercial Systems Operation. Technical Review Board (TRB) Chairman for Parts Reliability Assessments and test regime optimization for spaceflight applications, Six-Sigma Certification project; ***Electromagnetic Interference (EMI) engineering analysis techniques***

7/90 -10/94 — **Test and Radiation Effects Section Supervisor**, **APPLIED PHYSICS LABORATORY / JOHNS HOPKINS UNIVERSITY, SPACE DEPARTMENT**, Laurel, MD.
Near Earth Asteroid Rendezvous (NEAR-Shoemaker) and the Advanced Composition Experiment (ACE) solar satellite. Performed Reliability Engineering and modeling (NEAR, SSUSI instrument). Master's degree design project: **Hyperspectral Imager (HSI), *"Wavelength Agile Imaging Spectrograph"***, Based on tunable Tellurium Dioxide (TeO_2) acousto-optic modulator, CCD imagery and folded off-axis optics, modeled with ZEMAX Optical Design software; computer tools include UNIX, SAS, RELEX

7/89 - 7/90 **Microcircuits Processing Engineer**, HONEYWELL SASSO, Clearwater, FL Flight production development for the Silicon-On-Sapphire Microprocessor Chipset on the Titan/Centaur Inertial Navigation Unit.

2/87 - 7/89 **RF & Microwave Engineer**, **RCA/GE ASTROSPACE**, Princeton, NJ, Hybrids, MMICs and Passive device applications engineer for LEO TIROS / DMSP, GEO SATCOMs, NASA science missions and Space Shuttle TV cameras and monitors

Professional Societies and Organizations

- Optical Society of America (OSA) - Journal article referee
- Society of Photo-Optical Instrumentation Engineers (SPIE)- Journal article referee

Previously;

- American Institute of Aeronautics and Astronautics (AIAA),
- Institute of Electrical and Electronics Engineers (Radiation effects and Reliability)
- National Association of Radio and Telecommunications Engineers (NARTE)
- American Radio Relay League (ARRL)

INDUSTRY EXPERIENCE:

Customer Development (Matra Marconi, Lockheed Martin, Boeing, Northrop Grumman, NASA, Tri-services DoD)

- Conference Session Chairman - *Electronics Components for the Commercialization of Military and Space,* Components Tech Inc.

Project Technical Lead / Management for Guidance and Control Instruments and Systems

- Technical Director for USAF P81 satellite Command, Telemetry & Control Unit engineering model (P81 CTCU EM)
  - Proposal, design, development and production (CAM $2M)
  - Met all schedule, performance and cost targets as negotiated with Lockheed Martin
- Technical Board Chairman for Honeywell Space and Strategic Systems Division - Established and conducted EEE parts TRB
  - Technical Review Board (TRB) – Part Reliability Assessments and test regime composition/reduction
  - Customer Parts, Materials and Processes Control
  - Honeywell Integrated Product Development Process Team (IPDPT) stakeholder and process keeper

- Systems Engineer
    - High performance aerospace command, control & inertial / Ring Laser Gyroscope (RLG) navigation systems
    - USAF/LMMS P81 satellite Control Electronics Assembly; Harness/ interconnect specification, requirements flow-down
- Product Assurance Manager – ISO 9000, Best-in-Class practices, and NASA
    - US Navy UHF Follow-On satellite; Johns Hopkins/APL direct USN Program Office report

Product Development / Development of enabling technologies/ trade studies

- Prototype design, development and characterization of clinical research grade Total Internal Reflection Holographic Microscope
- Product development, prototyping and production of Micro Opto-Electro Mechanical Systems (MOEMS) interferometric sensors
- Earth Reference Attitude Determination System (ERADS) spiral-development radiation characterization program
- Application Specific Integrated Circuit (ASIC) development, qualification and flight delivery
- Ball-grid-array (BGA)/microvia printed wiring assembly development, qualification and flight deliveries

Engineering and Applications

– Instrument design, analysis, manufacturing, test and specialties management

- Instrument design; hardware and software design, build, test and application for digital imagery
- Radiation Effects Team Lead for Commercial Systems Operation communications satellites
    - Mission assessments /orbit analyses; Single event effects, total dose, circumvention and reconfiguration, EMI/EMC
- Design criterion for Ball-Grid-Array/Microvia printed wiring assemblies based on benchmarking and qualification tests
- Systems design analyses, evaluation and program recommendations
    - Near Earth Asteroid Rendezvous solar arrays (NEAR-Shoemaker), Ultraviolet Spectrographic Imager (SSUSI),
- Process development, design, line supervision/team lead for high reliability varactors
- Honeywell Program Review Team member; Design, Manufacturing and Test Readiness Review; Customer and sub-tier
- Silicon-On-Sapphire Flight Microprocessor Chipset yield cognizance for TITAN/CENTAUR Inertial Navigation Unit
- Particle beam radiation testing; Brookhaven heavy ion Single Event Effects (SEE/SEU) testing, UC Davis proton beam
- Requirements verification and validation for strategic inertial systems test equipment on Pendulous Inertial Gyro Assembly (PIGA)

SKILLS

- Trained Team Leader; interview/hiring, coaching, individual and team development
- Opto-electronics Instrument Design – Interferometers for Digital Holographic Microscopy; hardware and software
    - Digital holographic interferometer design, build and test; Mach-Zehnder and Michelson
    - Angular Spectrum Method with Fast Fourier numerical reconstruction performed with LabVIEW and MATLAB
- Radiation effects planning, characterization, and supervision; ionizing radiation, total dose effects, single event effects on electronics
    - Radiation test specification and analysis for optical components; charge injection device cameras, fiber bundles, optocouplers
- Work Breakdown Structure management - Creation, implementation and cognizance; Systems and specialties engineering
- Generate and approve Program plans, Technical Directives, Statement-of-Work/SOW, RFQ/RFP, Engineering Documents, SoCD
- Valued Tiger-Team member -Synergistic investigator, semiconductor processing and physics
- Critical/Strategic Commodities specialist – Make-versus-buy assessments, subcontractor mgmt
- Six-Sigma Greenbelt Certified; Project title: *Electromagnetic Interference (EMI) engineering analysis*
- Hands on experience with silicon micromachining, doping, diffusion, metallization and wet chemistry
- Testing of all part/device/board/assembly/component/system levels up to and including final unit acceptance for delivery
- Master's degree design project: "***Wavelength Agile Imaging Spectrograph"*** (**Hyperspectral Imager (HSI))** modeled in ZEMAX
    - Based on tunable Tellurium Dioxide (TeO_2) acousto-optic modulator, CCD imagery & folded off-axis optics
- Application and test of Microwave Integrated Circuits (MMIC) and hybrid microcircuits, GaAs devices and Space Shuttle color TV
- RF and Microwave devices design application and test for communications and weather satellites (USAF DMSP, ACTS, ANIK-E)

SOFTWARE - ZEMAX, LabVIEW, MATLAB, MAPLE, Mathematica, Vernier Labquest Logger Pro 3, SAS, DOORS, RELEX, FORTRAN, BASIC

<u>Seminars, Colloquia and Working Groups</u>

USF College of Business, 2nd Annual FINTECH Business Plan Competition, Judge, 5/14/2010

MOSI 2nd Annual Innovation Express Contest, Tampa Bay area Elementary and Middle school, Volunteer Judge, USF Chapter of the National Academy of Inventors, 2/2010

USF 2nd Annual Graduate Student Research Symposium, 2009 ResearchOne, Dissertation research presentation, 10/8/2009

Strategic Marketing Assessment, Proteacel Gene Transfer Venture, H. Lee Moffitt Cancer Center and Research Institute with the USF College of Business Entrepreneur and IGERT program, 12/08 – 5/09

Pizzo Elementary School Science Fair Judge, as USF Optical Society of America Student Chapter President, 12/19/08

Frontiers in Optics (FiO) Optical Society of America Conference, Student Leadership Council, USF Representative, University of Rochester, 10/08

"Optical Society of America USF Student Chapter and Digital Interference Holography in Ophthalmology" presented to USF Pre-Optometry Society, 9/18/08

"Preparing for the Physics Subject GRE -or- "It's all about Time!" (And some Space and Matter)" presentation, Society of Physics Students colloquium, University of South Florida, Department of Physics, 4/14/08

"Transitioning between Physics in the Aerospace Industry and Academia" presentation, Society of Physics Students colloquium, University of South Florida, Department of Physics, 4/9/08

IGERT Journal Club, 2007-2008. Presentation, "A Demonstration of Total Internal Reflection Holographic Microscopy for the Study of Cellular Motion," 11/1/2007

<u>USF Physics Department seminar series</u>

Spring08/09 **Advances in Physics**, Dr. Ivar Giaever - Nobel Laureate and USF Eminent Scholar

Spring08 **General Relativity**, Dr. David Rabson, ***Gravitation and Cosmology*** S. Weinberg

<u>USF Physics Department Summer Book Club (2007-2009)</u>

Summer09 ***Condensed Matter Field Theory***, Altland and Simmons
Summer08 ***A Modern Introduction to Quantum Field Theory***, M. Maggiore
Summer07 ***A Guide to Feynman Diagrams in the Many-Body Problem***, R. Mattuck

Electrical Engineering Graduate courses, USF, Tampa, FL, 9 Credits, 5/98-4/99