

MARCUS WILLIAM SHUTE, SR., P.E., Ph.D.

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Citizenship: United States of America

Security Clearance: Secret (inactive; previously held CNWDI, NATO)

SUMMARY

Accomplished senior technical executive, entrepreneur, technology consultant, scientist, and engineer with 30+ years of proven experience and leadership in research, development and engineering in established companies, emerging businesses, and academia.

- Proven record of accomplishment in building, motivating and leading interdisciplinary high-performance organizations to achieve outstanding results on schedule and under budget
- Self-starter with entrepreneurial spirit and exceptional background in visioning, strategic planning, technology innovation and roadmapping, program management, product development/service delivery, and technology transfer/commercialization
- Proficient in evaluating and cultivating emerging business ventures and new growth opportunities including developing strategic partnerships and identifying investment sources

PROFESSIONAL EXPERIENCE

SHUTE ENTERPRISES, INC., Atlanta, GA (www.ShuteEnt.com)

1987 - Present

Consultant

- Fractional CTO for emerging companies; proficient in technology development and commercialization; transition R&D to product development/service delivery in compressed timeframe
- Technical consultant and subject matter expert in renewable energy; optical communication; wireless communication; materials (nanotechnology); intellectual property management; digital media (serious games); science, technology and innovation policy; and several emerging technologies
- Mentor for the Advanced Technology Development Center startup accelerator at the Georgia Institute of Technology to advise tech entrepreneurs on customer discovery, venture formation, commercialization, business model validation, capital acquisition, etc.
- Appointed as member of several Army Science Board study panels to develop an innovation culture in the Army, talent management strategies, cybersecurity strategies and initiatives, using experimentation to transition technology into solutions for the warfighter, etc.
- Some engagements include: serving as functional CTO for a renewable energy and technology company to commercialize "new-to-the-world" solar module technology; advising a mobile social media software development venture; advising an inventor/ small business developing a new training aid/rehabilitation product; and assisting an inventor in assessing commercial viability of new hybrid electric vehicle concept

PRUUVN INC., Atlanta, GA (www.pruuvn.com)

2020 - Present

Co-Founder and COO

- Pruvvn® is a blockchain-enabled data trust developing tools to empower the gig economy; we simplify contractor onboarding, training and compliance from multiple steps and processes into one-click
- Led lean startup process to refine and establish financial model, launch market, product market fit, and pitch for outside investment
- Developed and implementing overall operations plan and policies for the company including outsourcing, intellectual property management, CS/CX, sales and marketing/customer acquisition, and funding strategy

510NANO INC., Durham, NC (www.510nano.com)

2014 - 2018

Vice President, R&D and Commercialization/Group President, Scarab Technologies LLC

- 510nano is a renewable energy and technology development enterprise
- Led the product development and commercialization effort for Solar VIA™, 510nano's patent-pending solar module technology, including transitioning design to "ready to manufacture" state, identifying and managing supply chain partners, and third party manufacturer
- Assisted in development of overall vision, business plan and policies, intellectual property management and patent prosecution, and funding strategy for the firm
- Provided oversight of proposal development effort for extramural funding opportunities from various government and private sources for research and commercialization of Solar VIA™ and cQuest™ (510nano's carbon recycling technology)

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- Responsible for establishment and operation of Scarab Technologies LLC, 510nano's future technology commercialization subsidiary

CLARK ATLANTA UNIVERSITY, Atlanta, GA (www.cau.edu/research)

2008 - 2014

Vice President, Research and Sponsored Programs

Professor, Physics and Dual Degree Engineering Program

- Developed and implemented vision, mission and strategic plan for the research enterprise including staffing, policy and process development, and resource management
- Developed and implemented the commercialization and tech transfer program including development and training program for intellectual property
- Led and managed major funding initiatives and interaction with external funding sources including major corporations, federal agencies and Congressional delegation
- Developed and managed program for research compliance including internal controls, corrective action plans, and development of online training program (RSP Academy) to resolve prior compliance problems and audit findings, and federal research compliance agreement and oversight
- Developed and led initiatives for two university strategic plans and one SACS accreditation cycle
- Led development of framework for new graduate programs in Computational Sciences and Materials Science

Committees and Initiatives: University's Executive Cabinet; University's Strategic Planning Oversight Committee; The National Academies Emerging Research Institutions Committee (2008); Consultant to the Army Science Board – Innovation Study Panel (2013); Senior Advisory Committee of Intelligence Community Centers of Academic Excellence; Executive Advisory Committee of Clarkson Aerospace/Air Force Research Labs/HBCU Nanoscience Initiative; other ad-hoc University committees.

TENNESSEE STATE UNIVERSITY, Nashville, TN (www.tnstate.edu/research)

2003 - 2008

Vice President, Research and Sponsored Programs

Professor, Electrical and Computer Engineering

- Developed and implemented the research vision and mission of the University including establishing and leading new research initiatives in areas such as nanotechnology, photonics, biotechnology/bio-safety, learning sciences, and technology transfer and commercialization
- Responsible for management of research centers and oversight of 150+ staff members in the research enterprise
- Responsible for design, development and construction of \$14M+, 62,000 sq. ft. research building which is the first facility of this type at the University
- Obtained ~\$6M in congressionally directed awards for various initiatives and research infrastructure including funding for the Nanosciences and Biotechnology Core Facility and university-connected research foundation

Committees and Initiatives: University President's Council; The National Academies Emerging Research Institutions Committee; State of Tennessee Experimental Program to Stimulate Competitive Research Committee; State of Tennessee Cyber-Infrastructure Committee; State of Tennessee Optical Network (OneTN) Subcommittee; Senior Advisory Committee of Intelligence Community Centers of Academic Excellence; Executive Advisory Committee of Clarkson Aerospace/Air Force Research Labs/HBCU Nanoscience Initiative; Advisory Board of Cumberland Emerging Technologies biotechnology incubator; Tennessee Board of Regents Research Vision Committee; various dissertation committees and other ad-hoc University committees.

LUXCORE NETWORKS, INC., Atlanta, GA

2000 - 2002

Vice President, Advanced Technologies

Vice President, Engineering

- Created and managed the technical and R&D business units of start-up company including technical staffing and resource management, and development of performance based compensation and evaluation plan
- Led Phase I development effort for all-optical switching and transport system prototype in compressed timeframe and under budget; system demonstration conducted at 2001 OFC resulting in "Best of Systems" and "Best of Show" awards
- Assisted in creating strategic plan and technology roadmap for the start-up company including ISO registration effort and new product introduction gate process
- Developed, identified and evaluated new technologies and intellectual property to enable Luxcore's product solutions including ultra-long reach systems, all-optical wavelength conversion, optical amplification schemes, dispersion management, and advanced switching architectures
- Assisted in developing business case and communicating technology differentiation/value proposition resulting in \$22.5M+ venture capital investment

BELL LABORATORIES / LUCENT TECHNOLOGIES, Naperville, IL / Atlanta, GA 1998 - 2000**Distinguished Member of Technical Staff, Wireless Networks Group, Mobility Solutions Services**

- Served as lead RF optimization engineer responsible for several engineering teams performing the optimization of CDMA PCS and 850MHz wireless systems during system deployment; all deadlines met under budget
- Cultivated and conducted system performance audits of existing wireless communications systems
- Developed RF engineering certification program and taught multiple courses in Wireless University of Bell Laboratories

AT&T BELL LABORATORIES / LUCENT TECHNOLOGIES, Norcross, GA**1986 - 1998****Member of Technical Staff, Transmission Media Laboratory**

- Responsible for the Reliability Assurance Program for the Optical-Application Specific Integrated Circuits (OASIC) Program including dense wavelength division multiplexing (DWDM) devices
- Led cross-organizational, multi-location development team responsible for development, fabrication, and qualification of linear optical fiber amplifiers for broadband communication systems
- Managed the Destroyed Furnace QIT in manufacturing environment that optimized, developed and evaluated the performance of furnace designs for the optical fiber production facility (realized > \$1M savings in 9 months)
- Developed and tested fiber designs used in military applications such as fiber optic guided vehicles (\$2.9B DoD Non-Line of Sight FOG-V program), nuclear radiation environments, tactical fiber optic cable assemblies used in the Patriot Missile System during Operation Desert Storm (\$70M US Army TFOCA program)
- Developed the optical fiber design and development plan for qualification of AT&T Network Cable Systems for successful ISO 9001 registration
- Subject matter expert on optical fibers and optical fiber communication systems, specifically tactical and specialty applications of optical fibers, optical fiber sensors, and polarization phenomena; developed courses for internal and external constituents
- Actively participated in technical recruiting activities and mentored over 200 technical professionals and students

AT&T BELL LABORATORIES, Murray Hill, NJ**1983 - 1985****Senior Technical Associate, Semiconductor Materials Laboratory (1984-1985, Summers)****Senior Technical Associate, Lightwave Component Research Laboratory (1983, Summer)****UNITED CITIES GAS COMPANY, Nashville, TN****1980 - 1982****Project Engineering Intern (Summers)****AFFILIATIONS**

Member of SPIE, Optical Society of America, National Society of Black Engineers, Institute of Electrical and Electronics Engineers (Senior Member), American Society of Mechanical Engineers (chairman of TSU Student Section), MIT Enterprise Forum – Atlanta Chapter, and DeKalb County Advisory Board of the United Way of Metropolitan Atlanta; Member, Army Science Board; Director & Founder, Aspire 2B, Inc.; Peer Reviewer, National Science Foundation, 2004; Life Member, Tennessee State University Alumni Association; Life Member, Basileus (Tau Chapter), State Keeper of Records & Seal (Chief Administrative Officer-GA), and Seventh District Keeper of Records & Seal (GA, FL, AL, MS), Omega Psi Phi Fraternity, Inc.; Vice Chair, Board, Genesis Innovation Academy, Inc. (K-10 charter school); Mentor/Coach, WOMEN Unlimited, Inc.; St. Philip A.M.E. Church; Board of Directors, Black Alumni/ae of MIT, 1997-1999; Member, AT&T/Lucent Track Team, 1997-present; Member, Atlanta Track Club, 2003-2005; Member, Southwest Sprinters Track Club; 2005-present; Member, National Council of University Research Administrators; Member, Association of University Technology Managers; Member, National Academy of Inventors

HONORS AND AWARDS

1994 U.S. Black Engineer of the Year Award, Most Promising Engineer; 1999 Golden Torch Award for Engineering Excellence, National Society of Black Engineers; **2005 NTA Technical Achiever of the Year Award, Engineering**, National Technical Association; **2006 Golden Torch Award for Alumni Technologist of the Year**, National Society of Black Engineers; **2011 Distinguished HBCU Alumni Award** by U.S. Black Engineer of the Year/Career Communications Group; Finalist, NASA Mission Specialist Astronaut Program, class of 2000; The Honor Society of Phi Kappa Phi; Pi Tau Sigma Mechanical Engineering Honor Society; 1996 Distinguished Alumni Citation of the Year Award, National Association for Equal Opportunity in Higher Education; Council of Outstanding Young Engineering Alumni Award, Georgia Institute of Technology, 1996; 1992 Omega Man of the

Year and 1992 Basileus' Award Recipient, Tau Chapter, Omega Psi Phi Fraternity, Inc.; Who's Who in the South and Southwest, 1990; Who's Who of Emerging Leaders in America, 1991; Mechanical Engineering Alumnus of the Year, Tennessee State University, 1993; 1992 Georgia Tech Black Engineer of the Year Award; NASA Space Grant Consortium Fellow, 1990-1994; AT&T Doctoral Support Program Fellow, 1990-1994; Omega Psi Phi Creative Research Fellow, 1992; U.S. Patent #5,130,535, 1992; U.S. Patent #5,703,990, 1997; AT&T Bell Laboratories Cooperative Research Fellowship, 1984-1986; Most Outstanding Engineering and Honors Program Student, 1980-1984; University Scholar, 1984; INROADS Scholar, 1983; National Dean's List, 1983-1984; Professional Engineer (Mechanical), Georgia; Who's Who Among Students in American Colleges and Universities, 1983-1984

EDUCATION

Ph.D., Doctor of Philosophy in Mechanical Engineering / Minor, Mathematics, Georgia Institute of Technology, Atlanta, GA (1994)

Emphasis in fiber optic sensors, acoustics, and mechanics.

Dissertation: "Polarization-Maintaining Optical Fiber as a Sensor of Shell Vibrations"

M.S., Mechanical Engineering, Georgia Institute of Technology, Atlanta, GA (1991)

Emphasis in fiber optic sensors, acousto-optics, and mechanics.

P.E., Professional Engineer (Mechanical), State of Georgia (1987)

M.S., Materials Science / Minor in Electronic Materials, Massachusetts Institute of Technology, Cambridge, MA (1986)

Thesis: "Spin-Polarized Photoelectrons from GaAs"

B.S., Mechanical Engineering, Tennessee State University, Nashville, TN (1984)

University Scholar, Highest Distinction, GPA: 4.00/4.00

Thesis: "Effect of Various Oxides on the Strength Performance of Optical Fibers"

PUBLICATIONS AND PRESENTATIONS

Over 50 invited and contributed scientific and business publications, presentations, and several technical patents. Served on numerous review panels and advisory boards for government agencies and academic institutions.

EXTRAMURAL FUNDING

More than \$6M in extramural research funding obtained as principal investigator. Assisted in obtaining >\$24M in venture capital funding for emerging high-tech ventures.