JOHN VINCENT, PH.D.

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ELECTRICAL ENGINEER

Over 30 years of success in leadership, design, advancement, and cradle-to-grave management of cyclotrons and associated systems for applications ranging from research to medical particle accelerators.

Leverage technical and organizational leadership best practices, coupled with electrical and systems engineering expertise to drive efficiency, workflow, and productivity improvements. Excel in architecting innovative, first-of-a-kind systems and controls, designing policies and procedures aligned with organizational needs, and managing projects to defined scopes of work. Equally strong in tailoring management style to accommodate diverse experience levels and situations with teams ranging from skilled laborers to nuclear physicists in both union and nonunion environments. Diplomatic, articulate communicator experienced in presenting to DoE and military agencies.

CORE COMPETENCIES

- Organizational Leadership
- Multidisciplinary Team Leadership
- Electromagnetic Analysis & Design
- Systems Modeling & Dynamic Control
- Value Based Engineering
- Real-time Embedded Software Development
- Large Scale Control Systems Design
- Accelerator RF Systems
- Project & Program Management
- Process & Productivity Improvements
- Grant Writing & Management
- Estimating, Budgeting & Cost Controls
- Systems Engineering
- Analog & Digital Instrumentation Design
- Staff Mentoring, Training & Development
- ISO 9001, ISO 14001, OHSAS 18001, ISO 27001 experience

PROFESSIONAL EXPERIENCE

Vincent Cyclotron Systems, LLC ◆ Owner ◆ 2023 – present

Provide scientific design and engineering upgrade services for particle accelerators aimed primarily at cyclotrons.

Ionetix Corporation ◆ VP R&D ◆ 2012 – 2022

Provide organizational scientific, technical, and managerial leadership to the development of world leading medical accelerators and associated systems.

Selected Accomplishments:

- Provided the conceptual design and initial beam dynamics for a strong focusing, cold steel, compact superconducting cyclotron for PET N13 cardiology applications.
- Identified, formed, and managed an international team of leading experts in cyclotron beam physics and magnet design.
- Established a Michigan location and staff to design, develop, and test cyclotrons and associated systems.
- Established a plausible project plan and led the effort to develop a strong focusing compact superconducting cyclotron from concept to testing in approximately 2 years.
- Fully Upgraded and rebuilt a CS-30 cyclotron aimed at Targeted Alpha Theraphy.

MICHIGAN STATE UNIVERSITY (MSU) 1983 – 2014

Facility for Rare Isotope Beams (FRIB – formally RIA) ◆ 2000 – 2011

Lead cost engineering and systems management for successful MSU bid, plus specification and design for FRIB utilities, RF systems, power supplies, and control systems. Provide project manager with guidance and advice during executive meetings.

Selected Accomplishments:

- Played key role in MSU's 2009 win of $650M FRIB project over Argonne National Laboratory by developing and leveraging bottoms-up cost estimating and documentation process to develop phased project plan including timeline and resource requirements.
- Reduced development cost by more than 50% by leading research and development of advanced digital RF controls and solid state amplifiers, rather than purchasing these components.
- Developed a world leading technique for controlling rf resonators that has improved the control and regulation of these critical elements by better than a factor of three.
- Chief Electrical Engineer 2009 - 2011.
- Senior Advisor – 2012 - 2013

National Superconducting Cyclotron Laboratory (NSCL) Chief Engineer ◆ 2005 – 2012

Advise all NSCL engineering projects and project leaders on management and technical issues.

Selected Accomplishment:

- Optimized laboratory operations by writing spare parts policy, creating safety of accelerators policy based on DOE Order 420.2b, leading safety assessments, approving new and upgraded equipment, and documenting processes.

NSCL Electronics Department Head ◆ 1986 – 2012

Lead Electronics Department to design, upgrade, and maintain electronic systems for internationally recognized, 350-member nuclear physics research facility. Provide technical and administrative leadership for team of 15-20 electrical engineers, computer scientists, and technicians with credentials ranging up to Ph.D's. Manage equipment design, development, and construction, $450K-$750K annual budget, and external contracts.

NSCL Electronics Department Head, continued…

Selected Accomplishments:

- Transformed dysfunctional Electronics Department into laboratory's most respected, organized, and productive department by isolating department from distractions, providing strong leadership, instituting formal document control, project management, and estimation processes, and building specialized matrixed, quasi-independent, yet highly collaborative internal groups.
- Optimized department performance and productivity by training and mentoring new engineers to lead RF, Control Systems, and Power Supplies projects.
- Spearheaded facility-wide upgrade to EPICS control system through use of both custom controls and standard PLCs.
- Improved NSCL facility availability overall through planning, budget negotiations, and design/replacement of unreliable and obsolete electronic systems.
- Hand-picked to lead cryogenic experts in making critical system decisions for coupled cyclotron facility new cryogenics plant. Architected and designed accelerator community's first fully PLC controlled cryogenics plant and load control system, achieving NSCL's first reliability levels to exceed 99.5%.

NSCL RF Project Leader ◆ 1985 – 2010

Promoted from NSCL RF Engineer (1983-1985) to manage projects from concept to grave. Designed, architected, and simulated systems and components for projects.

Selected Accomplishments:

- Designed neutron cyclotron RF system used for more than 10 years at Detroit Harper Hospital primarily for prostate cancer therapy.
- Utilized advanced published algorithms to design, architect, and simulate superconducting linac (2 to 16 KW, 80.5 and 322 MHz) solid state amplifiers and digital RF controls and modulators.
- Led ~$3M project to design world's highest energy superconducting cyclotron (K1200) RF system consisting of cyclotron RF resonators, 300 KW RF amplifiers, and RF controls tunable from 9 to 27 MHz.

- Spearheaded ~$3M upgrade of world's first superconducting cyclotron one full year ahead of schedule.
- Hired, mentored, and transferred leadership to other engineers.

Additional experience as Independent Consultant, dba Precision Power Products.

- Worked with clients including Argonne National Laboratory, Thomas Jefferson National Laboratory, BWX Technologies, and Still River Systems.

EDUCATION

MICHIGAN STATE UNIVERSITY
Ph.D. in Electrical Engineering
Thesis: "Modeling and Analysis of RF Structures using an Equivalent Circuit Methodology with Application to Charged Particle Accelerator RF Structures."
Master of Science in Electrical Engineering
Bachelor of Science in Electrical Engineering

RESEARCH APPOINTMENT

MICHIGAN STATE UNIVERSITY
Adjunct Professor of Engineering
Department of Electrical & Computer Engineering
2005 – 2012

MILITARY SERVICE

UNITED STATES MARINE CORP
Officer Candidate

UNITED STATES ARMY
Sergeant, Army Security Agency
Honors: Top Secret Security Clearance, Good Conduct Medal, Army Accommodation Medal for Merit

SELECTED PUBLICATIONS

John Vincent, et. al, "THE IONETIX ION-12SC COMPACT SUPERCONDUCTING CYCLOTRON FOR PRODUCTION OF MEDICAL ISOTOPES", *Proceedings of the 21st International Conference on Cyclotrons and their Applications*, pp. 290, 2016.

V.Smirnov, S.Vorozhtsov, **J. Vincent** "Design study of an ultra-compact superconducting cyclotron for isotope production" *Nuclear Instruments and Methods in Physics Research*, A , 7pp. 6-12, 2014.

John Vincent, Dan Morris, Nathan Usher, Zhiqiang Gao, Shen Zhao, Achille Nicolette, Qinling Zheng, "On active disturbance rejection based control design for superconducting RF cavities" *Nuclear Instruments and Methods in Physics Research*, A , 643: 1, pp. 11-16, 2011.

Bazin, D., Andreev, V., Becerril, A., Dole, M., Mantica, P.F., Ottarson, J., Schatz, H., Stoker, J.B., **Vincent, J.** "Radio Frequency Fragment Separator at NSCL." *Nuclear Instruments and Methods in Physics Research*, A , 606: 3, pp. 314-319, 2009.

Kandil, T., Grimm, T.L., Hartung, W., Khalil, H.K., Popielarski, J., **Vincent, J.**, York, R.C. "Adaptive Feedforward Cancellation of Sinusoidal Disturbances in Superconducting RF Cavities." *Nuclear Instruments and Methods in Physics Research*, A , 550(3), pp. 514-520, 2005.

Vincent, J. "Inexpensive RF Modeling and Analysis Techniques as Applied to Cyclotrons." Marti, F. (Ed.), *Cyclotrons and their Applications 2001*, Sixteenth Annual Conference, pp. 292-296, 2001.

Schillo, M., Geisler, A., Hobl, A., Klein, H.U., Krischel, D., Meyer-Reumers, M., Piel, C., Blosser, H., Kim, J.W., Marti, F., **Vincent, J.**, Brandenburg, S., Beijers, J.P.M. "Compact Superconducting 250 MeV Proton Cyclotron for the PSI Proton Therapy Project." AIP Conference Proceedings, 600, p. 37, 2001.

Vincent, J., Foth, L., McGilvra, A., Priller, J. "The NSCL Control System." *IEEE Transactions on Nuclear Science*, 43:1, 30-38, 1996.

York, R.C., Blosser, T., Grimm, T., Johnson, D., Lawton, D., Marti, F., **Vincent, J.**, Wu, X., Zeller, A.F. "Proposed Upgrade of the NSCL." Particle Accelerator Conference, 1, 1995.

Blosser, H., **Vincent, J.**, . "Performance of the Harper Hospital Cyclotron: Effect of Pulsed Radio Frequency." *Proceedings of the 13th International Conference of Cycltrons and their Applications*, p. 133, 1992.

Blosser, H., Burleigh, R., Johnson, D., Kuo, T., Marti, F., **Vincent, J.**, Wagner, J., Zeller, A. "Medical Accelerator Projects at Michigan State University." *Particle Accelerator Conference*, pp. 742-746, 1989.

Blosser, H., Bailey, J., Burleigh, R., Johnson, D., Kashy, E., Kuo, T., Marti, F., **Vincent, J.**, Zeller, A. "Superconducting Cyclotron for Medical Application." *IEEE Transactions on Magnetics*, 25: 2, pp. 1746-1754, 1989.

Maughan, R.L., Blosser, H.G., Powers, W.E., Blosser, E.B., Blosser, G.F., **Vincent, J.**, Ezzell, G.A., Orton, C.G., Ragan, D.P. "Progress with the Superconducting Cyclotron Neutron Therapy Facility for Harper-Grace Hospitals." *Radiation Protection Dosimetry*, 1988.

Blosser, H., DeKamp, J., Griffin, J., Johnson, D., Marti, F., Milton, B., **Vincent, J.**, . "Compact Superconducting Cyclotrons for Neutron Therapy." *IEEE Transactions on Nuclear Science*, NS-32: No. 5, 1985.

Blosser, H., **Vincent, J.**, . "Cyclotrons and Synchrotrons for Oncology Therapy." Workshop on Accelerators for Charged-Particle beam Therapy Facilities. Fermilab, 1985.

Reidel, J., **Vincent, J.** "The RF Systems of the MSU K500 and K800 Cyclotrons." *Proceedings of the Tenth International Conferenece on Cyclotrons and Their Applications*, pp. 314-316 1984.

Graduate Student Theses:

Usher, N. Thesis: "Digital Low-Level Radio Frequency Control and Microphonics Mitigation of Superconducting Cavities." East Lansing, MI: Michigan State University, 2007.

O'Farrell, M. Thesis: "Low Level Radio Frequency Control of RIA Superconducting Cavities." East Lansing, MI: Michigan State University, 2005.

Kandil, T. Thesis: "Adaptive Feedforward Cancellation of Sinusoidal Disturbances in Superconducting Radio Frequency Cavities." East Lansing, MI: Michigan State University, 2005.

Molzahn, A. Thesis: "Digital Phase Detection in a Variable Frequency RF System." East Lansing, MI: Michigan State University, 2005.