

# Donald L. Birx, Ph.D.,MBA

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## PROFILE:

- Ability to lead, craft and implement a university vision through development and integration of research, education, strategic alliances, mentoring and organizational transformation
- Skilled at visualizing, communicating and realizing strategies involving innovative and novel approaches
- Experience across the university academic enterprise with considerable emphasis on the clustered integration of undergraduate and graduate education and research linked to successful fund raising.
- Significant expertise in multidisciplinary, university, congressional, business and community partnerships
- Research and technical expertise in adaptive technologies and predictive complex systems
- Varied background resulting in a strong appreciation of diversity, synergy and interdisciplinary education
- Expertise in leadership of organizationally complex and entrepreneurial endeavors and the implementation of change through university community involvement and support
- Solid grasp of financial operations, fundraising and budget performance in difficult environments

## EXPERIENCE:

### **Penn State Erie, The Behrend College, Erie, Pennsylvania**

**2010 to Present**

#### Chancellor and Professor

7/2010-Present

- Chief Executive and Academic Officer of the "Gem of the Penn State System" - a 850 acre, 4500 student undergraduate and graduate residential campus (with residence halls) organized into schools of Business, Engineering, Science and the Humanities and located on rolling hills by Lake Erie
- Developed a strategic plan for the campus based on regional transformation and integrative curricula founded on a balance of passion and practice and focused on building multidisciplinary leaders
- Co-Founded the Center for Life-Long learning, a modular, stackable and transferable approach to education of non-traditional students that increases diversity and access for disadvantaged students
- Fostered extensive relationships with industry that model the land-grant mission in agriculture
- Co-Founded Behrend's Open Laboratory, an approach where faculty, students and industry come together to put research and innovation into practice, blurring boundaries and forming integrated teams
- Started the Digital Arts, Media and Technology Program based around the integration of the arts, humanities and social sciences with engineering/science based gaming and modeling technology for entertainment, virtual environment development, modeling and simulation and digital manufacturing
- Secured, through Engineering, modeling and simulation software from Autodesk valued at \$100 million
- Developed a community/university partnership to provide an alternative to a traditional regional community college focused on the educational needs required for regional business growth
- Developed Penn State West in partnership with sister campuses to better serve the educational and economic/research needs of western Pennsylvania
- Advanced Behrend's academic reputation by pursuing and building on it's unique strengths in key areas -e.g. Behrend leads Penn State's online MBA program with students testing in the top 3% nationally
- Started Arts Management, 4 yr. Nursing, and Industrial Engineering majors and are in the process of starting Elementary Education and Environmental Sciences majors
- Pursued international partnerships in education/exchange and national recruiting to compensate for demographic shifts in Pennsylvania
- Revised promotion and tenure policies to allow faculty greater flexibility to excel
- Make all College promotion and tenure decisions
- Aggressively campaigned for, and implemented at Behrend, Penn State's new Intellectual property (IP) procedures that allow flexibility in ownership of IP
- Exceeded the campaign fund raising goal of \$32 million (>\$50 million to date) and overhauled the Council of Fellows into an organization with six project-focused teams built around our strategic goals
- Built Soccer/Lacrosse and track and field complexes in partnership with the athletic director, acquired a golf course and supported our teams in three consecutive conference President's Cup wins
- Maintained strong financial performance through a range of budget challenges

- Increased student and faculty diversity each year
- Behrend was named the #2 satellite campus in the U.S. in 2013 (theBestcolleges.org and Huffington Post) ahead of two major medical campuses and just after Carnegie Mellon's Silicon Valley Campus

**University of Houston System/University of Houston, Houston Texas****2006 to 2010**Vice Chancellor/President for Research and Professor

9/2006-7/2010

- Led the research enterprise of a major urban university system holding a dual appointment as Vice Chancellor for the University of Houston System and Vice President for the University of Houston
- Part of the team that developed an aggressive and successful strategy for university tier-one standing built around research and educational excellence
- Implemented elements of this plan by recruiting key faculty, core facility development (clean room, high throughput genetic analyzer, proteomics, imaging) and innovative cluster hires (up to \$25 million/cluster)
- Founded the Center for Industrial Partnerships - a joint endeavor that translates research to practical applications and increases the level of interplay between the business community and the university's research faculty
- Increased flexibility in IP licensing to allow corporate and joint IP ownership
- Initiated six system-wide, multidisciplinary, challenge-based clusters that span the colleges and campuses and focus strategic collaboration in Nano-Materials, Energy and Natural Resources, Bio-med, Complex Systems, Community Advancement and Education, and Arts and Human Enrichment
- Teamed with the Chancellor, Advancement, the Provost and the Colleges to assist development of UH Energy; and with the Vice President for Finance to establish the Energy Research Park
- Teamed with the Provost Office to explore a new approach to theme based undergraduate education in energy built on cross-disciplinary minors, certificates and energy tracks
- President of the Wind Alliance - a unique public, private partnership, the predecessor of which resulted UH's co-win of its second national center in the DOE Wind Center competition
- Co-chaired the R&D committee of the Houston Energy Alliance (part of the Greater Houston Partnership) to coordinate business and university research and development in energy
- Established a Research Deans Council and Center Leaders Council to jointly pursue strategic endeavors
- Reorganized the research office into teams for enhanced development as well as operations support
- System-wide research awards increased 15% the first year and were up 27% more the following year - to over \$110 million (the previous 15 year average was 3%/year), while proposal submittals are up 100% over three years to over \$550 million
- The increased research and a cluster-based approach to performance benefited graduate enrollment
- Jointly reorganized UH's approach to federal relations based on strategic, system-wide, cluster targets
- Initiated and led a research seminar series and developed support for joint research programs
- Team member for the successful Carnegie Engagement proposal and Undergraduate Research QEP
- Developed a 135,000 sq. ft. \$70 million cluster-based research facility to build collaborative strengths from atomic and molecular structure to drug and device delivery
- Held the appointment as tenured full professor of Electrical Engineering (2006)
- University of Houston advanced to Carnegie VHRL (First Tier) standing in Fall of 2010 becoming the first of Texas's emerging research universities to achieve that goal.

**New Mexico State University, Las Cruces, New Mexico****1996 to 2006**Interim Vice Provost/President for Research and Professor

8/2004-8/2006

- Led the Research Office of a Carnegie Research Extensive Land Grant University with over \$150 million in research expenditures
- Developed five university-wide research clusters that span the colleges and focus strategic collaborative endeavors in Space, Information Science, Bio-systems, Natural Resources and Border Development
- Established a Partnership with Los Alamos Laboratories in four joint initiative areas and proposed two state centers in technology translation and renewable resources
- Joined with the two other New Mexico Research Universities to develop a collaborative research Institute
- Developed an approach to enhance undergraduate research and non-tenure positions
- Initiated a successful strategic approach to federal relations and experienced the greatest research growth in fifteen years (>20% overall to \$154 million, > 35% PSL/PSI to \$65 million ) moving NMSU up in the standings from 125th(NSF04) to 99th(NSF06))

- Teamed with faculty and administrators in developing cross-disciplinary programs
- Held appointment as tenured full professor of Physics (2002)

Director, Physical Science Laboratory (PSL)

6/1996-10/2005

- Led a 450-500 person university-based applied R&D organization (PSL/PSI) that grew to \$54 million and eventually ~\$65 million in 2006 (from \$28 million) per year in contract expenditures and over \$2 million per year in fee income
- Rebuilt this venerable R&D laboratory (that grew out of the Physics department and placed over 10,000 students around the world) into a successful university partner and contributor, increasing student and faculty involvement in laboratory research and establishing laboratory educational components
- Successfully implemented a mission focused on implementation and growth of key 21st century technologies and training of students for leadership in these technologies
- Developed a comprehensive strategy and led the team that turned PSL's current account deficit into a multi-million dollar surplus, while bidding and winning \$100 million in new awards (a record) in one year
- Ensured proper administration of financial affairs and policies
- Founder and President the Physical Science Institute (PSI) for technology development and incubation
- Successfully implemented and grew PSI each year (to over 40 employees), tripling the initial investment of working capital and start-up funds and growing the revenue to ~ \$2 million/yr.
- Won university record 10- and 20-year, \$180 and \$236 million awards
- Key partner with the State in conceiving and developing the concepts behind the New Mexico Spaceport
- Developed strategic alliances and successful congressional initiatives in Information Science, Aerospace, Food Safety, Green Manufacturing, Border Security, Semiconductors, and Bioinformatics
- Established a unique Unmanned Aerial Vehicle Program with associated local air space (\$2-3 million/yr)
- Built a large project and instructional SCIF (Sensitive Compartmentalized Information Facility) and started a new classified student program that integrated education, research and applications (part of a larger endeavor that increased student involvement three-fold in laboratory technologies)
- Co-Developed with ARL/SLAD an innovative electromagnetic device that was recognized as one of the Army's "Top Ten Greatest inventions of 2004"; thousands are deployed for protection around the world
- Improved relationships with all colleges and increased cross-disciplinary projects, partnering with theater (digital animation and modeling), and history (intelligence) to build unique programs
- Established leadership in Information Operations technologies focused of applications of modeling and control of complex networks and decision making processes utilizing intelligent autonomous agents
- Awards:
  - New Mexico "Top 25" Tech leader (2002)
  - Davidson Memorial Award (2002), Distinguished Service Award (2001)
  - Year 2000 President's Award for "Vision, wisdom and leadership in guiding PSL through changing, challenging times"

**Systems Research Laboratories Inc., Dayton, Ohio**

**1977-1996**

Vice President and Team leader of Technology and New Ventures

1994-1996

- Chief technical officer for SRL leading new venture technology development, acquisition and integration
- Responsible for all SRL R&D supporting a portfolio of technologies
  - Artificial Intelligence
  - Automated Inspection Systems
  - Virtual Environments
  - Night Vision Goggles
  - Heads Up Displays
  - Industrial Process Control
  - Sensors, Radar, Antennas
  - Signal Analysis
  - Information Technology
  - Infra-red, Nuclear, Ultrasonic
- Led SRL's thrust in commercial applications of aerospace technologies
- Co-developed and implemented SRL's strategic plan through product development, spin-outs and strategic acquisition
- Successfully pioneered SRL's use of Economic Value Added techniques for evaluating acquisitions, market sector investment and internal performance
- Personally pursued fuzzy-neural adaptive systems for multi-loop nonlinear adaptive control (Visual C++, NT Platform) and signal analysis; intelligent agent development, intra-networking and speech processing
- Received IEEE Area Outstanding Scientist and Engineer Award for 1995

General Manager - Intelligent Systems Division 1987-1994

- Grew a division that had sustained a \$1 million loss and had few bookings to one of the largest and the most profitable divisions within the company with 1993 orders of over \$20 million
- Built a highly capable cross-functional team able to successfully perform complex multidisciplinary R&D projects
- Spearheaded a thrust into applications of advanced aerospace technologies
- Focused on R&D and rapid technology transfer of laboratory solutions to application, e.g. -
  - Automated inspection systems for aircraft engine components and metal sheet sensing employing electromagnetic and ultrasonic wave propagation and current interaction methodologies
  - Algorithms that employ sensor data for robotic positioning, and manipulators for contour following
  - Expert systems for diagnostics
  - Systems combining ultrasonics and signal processing to differentiate animal fat from muscle tissue and material anomalies in complex composite structures.
- Continued personal research in artificial intelligence and signal analysis, e.g. -
  - Connectionist models and fuzzy logic for adaptive process control
  - Chaotic oscillator modeling and wavelet design
  - Signal analysis in complex geometry interrogation
- Developed the first complex-mapping neural network that can process phase quadrature, complex FFT, and chaotic system phase plane data and applied it to advanced electromagnetic characterizations
- Mentored postgraduates
- Taught at Wright State University as an adjunct assistant professor

Principal Investigator and Program Manager 1980-1987

- Led a \$34-million Air Force program to design and develop an advanced automated inspection system
- Coordinated the activities of ten major subcontractors (GE, PWA, GTE, DDA, UDR1 etc.) and numerous professional participants
- Developed an intelligent, self-calibrating, self-dimensioning, self-diagnostic system containing seven computer-controlled inspection stations (multi-tasking, multi-processor environment) linked to two VAX 11/780 computers and utilizing electromagnetic and ultrasonic sensing techniques
- Designed the system around multi-axis robotic scanners with sensory-part-feedback algorithms for scanning of complex geometries and signal processing algorithms for improved flaw detection and sizing
- Completely automated the decision making and inspection processes and developed the first stages of an integrated CAD/CAM system for station modeling and scan plan construction
- Successfully installed the system in 1986. It paid for itself in the first year (based on the value of parts inspected), and has a projected lifetime savings of over \$1 billion
- The program was recognized by the Air Force Materials Laboratory as one of the most successful in the Laboratory's history
- Thirty-one additional inspection stations were procured and three additional engine inspection contracts awarded bringing the total value of contracts to over \$90 million
- Received the Howard Aiken award for technical accomplishment

Product Development Manager 1978-1980

- Designed a supervisory automatic control and inspection system utilizing master computation and slave I/O processor for the industrial laser inspection market
- Developed two new products including a "smart" laser scanner and gamma-backscattering-based measurement and control system
- Taught corporate microprocessor classes on system configuration and software/hardware development for Motorola and Intel microprocessor families
- Received the Excellent Performance award for product design and development

Senior Systems Engineer 1977-1978

- Developed a real-time, microprocessor-based, adaptive control program, which automatically determined all essential control parameters for floating action control of extruded products
- Systems built containing this algorithm grew to represent approximately 90 percent of all division sales were not successfully copied for many years

**Berg Electronics**, Lewisbury, PA

1974

1974 DuPont Student Fellow (Automated Machine Design and Intelligent Sensing)

- Perfected a technique for sonic signature monitoring of connector welds
- Designed a machine to conduct fluid into connectors

### EDUCATION AND CAPABILITIES:

University of Dayton

**Ph.D. EE** (4.0 GPA), **1990** (Gary Thiele, Advisor)

U.C. Berkeley

**B.S. Engineering Physics (Honor Student)**,  
**1974**

Miami University (Ohio)

**M.B.A. Finance** (4.0 GPA), **1980**

**M.S. (Bio)-Physics** (3.9 GPA), **1976**

Johns Hopkins University

Electrical Engineering and Computer Science,  
1970-72

- **Ph.D. Concentration:** Artificial Intelligence (Symbolic and Connectionist) and Adaptive Signal Processing, Electromagnetics, Antenna Theory (Moments, Physical Optics), Quantum Electronics
- **Courses Taught/Co-taught:** PH303 Energy, PH 561/461 E&M, EE548/448 Intro to Radar, EE590/490 SIGINT, Solid State Devices; Research Seminar Series
- **Affiliations:** Beta Gamma Sigma, Sigma Xi
- **Software Languages:** Lisp, FORTRAN, Prolog, C++, Pascal, Java, V Basic, Assembly, Mozart Oz
- **Committee Membership Record:** New Mexico Research Council, Council of Research Centers (chair), President's Cabinet, Provost Council, University Research Council, Promotion and Tenure, ABET, Administrative Council, Search Committees, Administrative Leadership Council, Penn State Online Steering Committee
- **Community Engagement Examples:** Board Member HARC, Alliance for Nano-Health Steering committee, Gulf Coast Consortium Steering Committee, Carnegie Community Engagement, QEP, etc., Elder, Chamber Board
- **Hobbies:** Skiing, Cycling, Swimming, Dirt Bike Riding, Astronomy

Have held a variety of security clearances including compartmentalized  
TOP SECRET SCI + with Polygraph currently

### SHORT PUBLICATION SUMMARY

D. Birx and S. Pipenberg, "A Complex Mapping Network for Phase Sensitive Classification", IEEE Transactions on Neural Networks, Vol. 4, No. 1, pp 127-135, 1993.

D. Birx and S. Pipenberg, "A Complex Multi-layer Neural Network for Defect Detection and Characterization", Review of Progress in Quantitative Nondestructive Evaluation, Vol. 10A, pp. 713-717, New York: Plenum Press, 1991.

D. Birx, S. Pipenberg, A. Schroder, "The Application of Signal Analysis Techniques to Tissue Characterization and Boundary Determination with Ultrasonics", Review of Progress in Quantitative Nondestructive Evaluation, Vol. 14B, pp.1773-1780, New York: Plenum Press, 1995.

D. Birx, The Design of a Neural Network that Performs a Complex Mapping for Phase Sensitive Detection and Characterization of Eddy Current Impedance Plane Data, Ph.D. Dissertation, University of Dayton, 1990.

D. Birx and S. Pipenberg, "Neural Network Structures for Defect Discrimination", Fifth Annual Aerospace Applications of Artificial Intelligence Conference Proceedings, Vol. I, pp. 233-245.1989.

R. Ko, D. Birx, "Automatic Positioning, Inspection and Signal Processing Techniques in the RFC System", Review of Progress in Quantitative Nondestructive Evaluation, 6A: p. 839, New York: Plenum Press, 1987.

T.W. Houk, D.L. Birx "Studies on the Effect of Electromagnetic Radiation on Enzymatic Substrates Employing Fluorometric Enzyme Assay Systems" 5<sup>th</sup> International Congress, Biophysics, Copenhagen, Denmark, 1975

D. Birx and D. Doolin, "Manufacturing Technology for Nondestructive Evaluation (NDE) System to Implement Retirement For Cause (RFC) Procedures for Gas Turbine Engine Components", Review of Progress in Quantitative Nondestructive Evaluation, 5A: pp. 877-884, New York: Plenum Press, 1986.

- D. Birx, F. Taylor, and D. Doolin, "Manufacturing Technology for a Nondestructive Evaluation (NDE) System to Implement Retirement For Cause (RFC) Procedures for Gas Turbine Engine Components", The World Conference on Nondestructive Testing, 3: pp. 1846-1852, Dallas: Taylor Publishing Co., 1985.
- D. Birx and D. Doolin, "Manufacturing Technology for Nondestructive Evaluation (NDE) System to Implement Retirement for Cause (RFC) Procedures for Gas Turbine Engine Components", Damage Tolerance Concepts for Critical Engine Components, Conference Proceedings 393. Advisory Group for Aerospace Research and Development (AGARD), pp. 8-1 -8-5, 1985.
- D. Birx and M. Coombs, "Understanding the Dynamics of the Digitized Battlefield" IEEE Systems, Man and Cybernetics Information Assurance and Security Workshop" June 6-7 2000 West Point, New York. (Later Published as M. Coombs and D. Birx , "Czerwinski's Order Regimes: Where Should we Begin to Address the IO Risk?", "Proceedings of the 2000 IEEE Workshop on Information Assurance and Security", United States Military Academy, West Point, NY, pp. 202f, 6-7 June 2000.
- Ray Ko, Ji-Han Xu, D. Birx, "Novel Signal Processing Techniques to Improve Defect Detection in Noisy Titanium Material", Review of Progress in Quantitative Nondestructive Evaluation, Vol. 13A, pp. 809-816 New York: Plenum Press, 1994.
- R.T. Ko, W.C. Hoppe, D.A. Stubbs, D.L. Birx, B. Olding and G. Williams, "An update on automatic position, inspection and signal processing techniques in the RFC/NDE inspection system", Review of Progress in Quantitative Nondestructive Evaluation, Vol. 6A, pp. 975-985 New York: Plenum Press, 1987
- J.H. Xu, D. Birx, "Neural Network Based Pattern Recognition for Defect Detection of Load/Lock Slots", Review of Progress in Quantitative Nondestructive Evaluation, Vol. 14A, pp. 835-840, New York: Plenum Press, 1995.
- M. J. Coombs, A. Taha, and D Birx, (1997). "Structuring the IO Diagnosis Problem", In Kadtko and Bulsara (eds.), "Applied Nonlinear Dynamics and Stochastic Systems Near the Millennium" AIP Conference Proceedings 411, San Diego, CA, July 1997, 203-312.
- D. Birx, and M. Coombs, "Information Operations – Decision Related Structures", 2<sup>nd</sup> Annual Classified Advanced Technology Update, Naval Post Graduate School, Monterey California, March 2000.
- D. Birx, R. Bernstein, M. Coombs, "The Metaphysics of Freewill and Determinism in an Agent modeling Environment" Presented at the Conference of Agent Modeling and Cross Disciplinary Discourse, Jan. 2002.
- Birx, D., "Cross Disciplinary Discourse, Logic, and Simulation: A Critical Dialog for the New Millennium". The Journal of Models and Modeling, Vol. 1, Number 1, pp. 3-6, January 2003.
- D. Birx; M. Coombs; M. Weaver; "Agent-Based Modeling of Multi-Resolucional Factors in Terrorist Recruitment", International Institute of Informatics and Systemics Proceedings, Vol. XVII, pp.80-85, July 2004.
- D. Birx; Lefebvre, V.; Schmidt, S.; "Structure-Determined and Emergent Procedures of Decision Making", International Institute of Informatics and Systemics Proceedings, Vol. XVII, pp. 92-94, July 2004.
- D. Birx, "Energy Security in the Next Decade and the Role of the Lone Star Wind Alliance", Texas Lyceum Journal, pp. 33-37, July 2009.
- S.Curran, J. Talla, S. Dias,D. Zhang, D. Carroll, D. Birx; "Electrical Transport Measurements of Highly Conductive ICarbon Nanotube/Poly (Bisphenol A Carbonate) Composite", Journal of Applied Physics, 105, 073711, May 2009 DOI:10.1063/1.3073938.
- K.S. Liao, J. Talla, S.Yambem, L. Ci, G.Chen, F. Caldren, D. Ahang, P.M. Ajayan and D.Birx and S.A. Curran; "Formation of highly Conductive Composite Coatings and Their Application to Broadband Antennas and Mechanical Transducers", Journal of Materials Research 25, 9, 1741, 2010.
- D.Birx, E. Anderson-Fletcher, E. Whitney; "Growing an Emerging Research University", Journal of Research Administration, Vol XLIII, Num 2, pp.11-35, Fall 2012
- D. Birx, R. Ford, C. Payne; "The University as an Open Laboratory", to be published as the second part of the previous journal article (est. Fall 2013).

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