Dr. Carlos O. Maidana

www.linkedin.com/in/maidanac • +66 9 1079 7061 • +1 (208) 904-4910 • carlos.omar.maidana@maidana-research.com

Project Manager & C-Level Executive
Senior Physicist & Research Engineer – University Faculty

Engineering | Physics | R&D | Management | Entrepreneurship | Education | Business Administration

Over 21 years of experience in scientific-technical R&D activities, project engineering, technical coordination, project management and business development mainly in the space, nuclear, scientific and defense domains at national and international level working for organizations such as NASA, CERN, U.S. Departments of Energy, Defense and Homeland Security, GISTDA as well as for small and medium size enterprises (SMEs) and universities. Over 19 years of experience in the design, modeling, simulation and optimization of advanced engineering components, scientific instruments and physical process. Over 25 years of hands-on experience in informatics and communications technology and over 13 years of experience in education at elementary, secondary, university and professional level including curriculum, e-learning and laboratory development activities.

Professional experience that spans cross disciplinary projects covering the whole design and development cycle: proposal writing, concept studies, design, modeling, simulation, fabrication, testing and optimization using different theoretical, computational and experimental techniques as well as managing working groups and test facilities. Supervision and guidance on the design, integration, testing, operation and maintenance of complex electronic and mechanical systems and sub-systems.

Able to integrate, develop and coordinate different types of knowledge and techniques that the modern cross-disciplinary projects require, with application of creative and proactive thinking beyond the standard discipline structures. A professional with experience in industry, academia, government and international organizations. A team leader who mentors with purpose and understands that strong working relationships create great teams and produce exceptional results.

CORE COMPETENCIES:

- Research and development
- Physics and Applied Physics
- Applied Engineering
- Design, modeling, simulation and optimization of engineering components and physical processes
- Management of scientific, engineering and R&D projects and facilities
- Large scale and complex international projects
- Innovation |Entrepreneurship
- Research commercialization
- Higher education / technical training
- Technology development
- Advanced engineering design
- Engineering analysis
- Computer aided engineering
- Modeling and simulations
- Scientific computing
- CAD/CAE/CAM
- Fabrication| Testing | QA/QC
- Optimization | Data analysis
- Reverse engineering
- Multi-disciplinary projects: mechanics, thermo-fluids, electromagnetics, optics, nuclear, electronics.
- Performance evaluation
- Software development
- Informatics & communications technology
- Systems engineering
- Project management
- Operations management
- Technical coordination
- Industrial organization
- Scientific - technical writing
- Public speaking
- Public administration
- Community management and public relations.
- Public engagement
- Technology transfer
- Business development
- Business administration
- Technical training
- Curriculum development
- E-learning
- Course management
- Teaching and counseling

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Languages: English (bilingual), Spanish (native), French (intermediate) – Several (survival level)
U.S. National - Permanent Resident – EB1/E11: Extraordinary ability in the sciences & engineering.
Citizenship: Argentina. Residency: United States and Thailand

EDUCATION & TRAINING

POST-DOCTORATE IN APPLIED ENGINEERING (SPACE NUCLEAR SYSTEMS), 2009
Washington State University, Pullman, Washington – United States

DOCTOR IN ENGINEERING AND APPLIED SCIENCE, 2007
Idaho State University, Pocatello, Idaho – United States

MASTER OF SCIENCE IN PHYSICS, 2003
Michigan State University, East Lansing, Michigan – United States

BACHELOR'S DEGREE IN PHYSICS AND APPLIED PHYSICS, 1999
Universidad Tecnologica Nacional (INSPT), Buenos Aires – Argentina

CERTIFICATE IN RESEARCH COMMERCIALIZATION, 2013
U.S. Small Business Administration – United States

CERTIFICATES IN SMALL BUSINESS ADMINISTRATION, 2013
U.S. Small Business Administration – United States

- Government contracting
- Business technology
- Cybersecurity for small businesses
- Crime prevention
- Crowdfunding
- Introduction to export
- Loan packaging

MODELING, EXPERIMENTATION AND VALIDATION SCHOOL, 2012
Oak Ridge National Laboratory and Idaho National Laboratory, United States

AUTODESK CAD/CAM/CAE FOR MECHANICAL ENGINEERING SPECIALIZATION, 2021

- Introduction to Mechanical Engineering Design and Manufacturing with Fusion 360
- Modeling and Design for Mechanical Engineers with Autodesk Fusion 360
- Simulation Analysis for Mechanical Engineers with Autodesk Fusion 360
- CAM and Design Manufacturing for Mechanical Engineers with Autodesk Fusion 360

STRATEGIC INTELLIGENCE STUDIES, 2000
Argentinean Army War College "Lt. Gral. Campos"

COMMERCE AND TRADE SPECIALIZATION DIPLOMA
Insituto Rivadavia – Secondary School, Argentina

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JR. NAVY RESERVE OFFICER TRAINING CORPS
Liceo Naval Militar "Alte. Storni", 3 years full time - Argentina

OTHER PROFESSIONAL TRAINNING

SHORT COURSES IN AERONAUTICS AND ASTRONAUTICS
American Institute of Aeronautics and Astronautics

- Hybrid Rocket Propulsion
- UAV conceptual design using computer simulations
- Overview of missile design and systems engineering
- Risk analysis and management

Technical University of Munich (TUM) and EdX

- Autonomous Navigation for Flight Robots

OTHERS

- **Safety, Security and Counter-Intelligence in National Security Technical-Scientific facilities**, training course: 11/2007, 6/2008, 1/2009, 9/2009 and 5/2010, Idaho National Laboratory, U.S. Department of Energy
- **Environmental protection and industrial hygiene, ISO 9000/14000**, training course: 11/2007, 6/2008 and 5/2010, Idaho National Laboratory, U.S. Department of Energy
- **Electrical Safety Awareness** training course; **radiation safety**, training course, **computer security**, training course and **industrial safety**, training course: 10/2010, 6/2011, CERN
- **LabView** – Core 1, 2011, CERN
- **COMSOL Multiphysics – Advanced Level**, 08/2017

Several others

PROFESSIONAL EXPERIENCE

EQUATORIAL SPACE SYSTEMS
Singapore and Thailand
https://www.equatorialspace.com

Equatorial Space Industries is developing a hybrid-propulsion launch vehicle tailor made for CubeSat operators complete with quick deployment, orbital flexibility and affordability in mind. It was founded in 2017 to create a low-cost, high frequency launchers, delivering up to 150 kg to LEO at a time.

HEAD - SPACE PAYLOADS and MISSION ANALYSIS
July 2021 - Present

Tasks

- Payload test system design, development, implementation and operations for satellites and suborbital payloads;

- Suborbital and Orbital payload design, prototyping, testing, and manufacturing and operations, inclusive of integration with launch systems;
- Mission planning and analysis, inclusive of orbital parameters planning, optimization, and payload integration with the launch system;
- Payload customer relations - business development, coordination of mission requirements and planning together with the client;

Research | Innovation | Space Payloads | Small Satellites | Instrumentation | Electronics | Circuit Analysis | | Embedded Systems | Mechanisms | Data Acquisition | Control Systems Engineering | 3D Printing | Rapid Prototyping | Computer Aided Design (CAD) | Computer Aided Engineering (CAE) | Computer aided Machinery (CAM) | Design for Manufacturing | Modeling and Simulations | Mechatronics | Testing | Vibration Measurements and Analysis | Thermal Measurements and Analysis | Electromagnetic Measurements and Analysis (EMI/EMC) | Radiation Calculations | Radiation Shielding | Environmental Testing | Materials Testing, Treatment and Post-Processing | Manufacturing | Milli-fluidics | Systems Engineering | Integration | Engineering Management | Project Management | Mission Planning | Mission Analysis | Orbital Mechanics | Software Engineering | Scientific Computing | Algorithms | Optimization | Tracking Station | Communications Systems | Atmospheric Re-entry | Customer Relations | Flight Safety | Documentation | Training | Mentorship | Technical coordination | Leadership

MANAGING DIRECTOR – EQUATORIAL SPACE THAILAND
July 2021 – Present

Manage Equatorial Space's upcoming Thailand office and operations, including all necessary business and administrative duties.

Business development | Business management | Government relations | Legal and administrative affairs | Contracting | Human Relations | Public Relations | Marketing

BOARD OF ADVISORS
November 2020 – June 2021

Orbital mechanics, satellite and suborbital payload development and testing. Training of human resources. Business development.

Software development | Mission Analysis | Teaching | Business Development | Consulting

OWNER & CHIEF EXECUTIVE OFFICER
MAIDANA RESEARCH – Incorporation United States and Thailand
CONSULTING, ENGINEERING DESIGN & SCIENTIFIC RESEARCH, 2013 – Present
www.maidana-research.com

MAIDANA RESEARCH is a small business dedicated to engineering design and scientific research. Its main set of activities rely on computer aided design, engineering and manufacturing (CAD/CAE/CAM),

basic and applied research in the engineering and physical sciences, and consulting in topics related to industries and advanced technologies deemed critical to national security and to long term economic development including aerospace, satellites, nuclear technologies, defense-related industries, and advanced energy systems.

MAIDANA RESEARCH also acts as a platform for research commercialization of new or disruptive technologies that can lead to the commercialization of specific products and services.

MAIDANA RESEARCH has been successfully registered before the US Small Business Administration getting the status of U.S. Federal Government Contractor (SBC # 000412360 / D-U-N-S # 079109504), before the European Commission as a research-intensive small company and a grant requestor organization (E.C. PIC # 952466766) and before the European Space Agency (ESABD # 24669).

Duties include managing, administrative and business development activities. Primary responsible in writing proposals, negotiating contracts, and financial transactions. Develop vital business relationships. Develop government relationships, local community relationships, and media relationships important to continued growth.

- Company incorporation, administration and management. Business development
- Technical, scientific and business consulting
- Technical and commercialization analysis in the energy, defense, industrial, scientific, medical and space sectors.
- Acquired status of U.S. federal government contractor
- Registered and recognized before the SBA, NSF, DoE, NIH, DoD, NASA, EU, ESA
- Acquired status of European Space Agency bidder / contractor
- Acquired recognition by the European Commission and the Swiss government as research SME start-up

The company was granted the small business innovation research awards 2015, 2016 and 2019 in advanced nuclear technologies; and it is a member of the U.S. Nuclear Industry Council.

- *Small Business Innovation Research award 2015 (U.S. Department of Energy)*
- *Small Business Innovative Research award 2016 (U.S. Department of Energy)*
- *Small Business Innovative Research award 2019 (U.S. Department of Energy)*

In collaboration with other organizations worked on the technical and business analysis, and commercialization aspects, of launching vehicles for small satellites in Low Earth Orbit and SSO. Such vehicles include LM11 vectors and sub-orbital systems.

The activities performed in the energy and defense sector include plasma converters, nuclear pumped lasers, regulatory aspects on power generation and distribution, advanced nuclear reactors and components, utilization of UAVs and Satellites in S.E. Asia, CubeSats and sub-orbital flight, and others.

Consulting activities include tasks as expert reviewer for the European Commission's Research Executive Agency (Horizon 2020) and development of national policies for the space sector.

Sub-orbital space work outside the United States was merged with Equatorial Space Systems, Singapore (IP acquired 07/07/2021).

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Keywords: engineering design | project engineering | engineering management | scientific research | research commercialization | product design | business development | business management | administration | operations management | strategic partnership | start up | product design | innovation | technology consulting | leadership

PROJECT MANAGER | ADVANCED NUCLEAR TECHNOLOGIES, 2015 – 2020
MAIDANA RESEARCH and U.S. Department of Energy

Lead researcher and project manager with direct responsibility for completion of the funded project, directing the research and reporting directly to the funding agency. Responsible for the preparation, conduct, and administration of the sponsored projects.

RD&D of the next generation of annular linear induction pumps for liquid metals and molten salts

- Software development for the analysis, design and fabrication of ALIPs
- Computer aided design and engineering of annular linear induction pumps (CADCAE)
- Digital monitoring and control systems: active flow control using machine learning and embedded systems
- Digital monitoring and control systems: thermal control and regulation using Arduino micro-controllers
- Advanced- and hybrid- manufacturing of annular linear induction pumps (metal 3D printing)

Development of a Small Electromagnetic Pump for Molten Salt Reactors – U.S. Department of Energy grant # DE-SC0019835

Computational methods for the design and fabrication of liquid metal thermomagnetic systems: U.S. Department of Energy under grant # DE-SC0013992.

Reactivation of the transient reactor test (TREAT) facility: design of liquid metal electromagnetic pumps. In partnership with the Idaho National Laboratory – U.S. Department of Energy.

Conceptual design of a novel 3D tomosynthesis device for low-dose high-resolution industrial and medical imaging using a compact linear accelerator.

Space nuclear power and propulsion: thermal energy conversion systems. In Collaboration with the National Aeronautics and Space Administration (NASA)

(Nuclear) Fission Surface Power Technology Project. In collaboration with OKLO, LLC for the U.S. Department of Energy and the National Aeronautics and Space Administration (NASA).

Keywords: Project Management | Principal Investigator | Project Director | Advanced Reactors | Magneto-hydro-dynamics | Thermo-Fluids | Electromagnetics | 3-Phase Power Systems | Instrumentation | Control Systems | Machine Learning | Arduino | High Temperature | Advanced- and Hybrid- Manufacturing | Structural Mechanics | Thermal Analysis | Radiation analysis | Modeling and Simulations | Multi-physics Analysis | Scientific Computing | Digital Prototyping | Software Engineering | Nuclear Power and Propulsion | Space Systems | Nuclear Engineering | Government – Industry partnership.

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PROJECT MANAGER | SPACE SCIENCE & TECHNOLOGY, 2019 – 2021
MAIDANA RESEARCH and
Geographical Information and Space Technology Development Agency (GISTDA) - Thailand

Lead researcher and project manager with direct responsibility for completion of the funded project, directing the research and reporting directly to the funding agency. Responsible for the preparation, conduct, and administration of the sponsored projects.

Design and Development of Scientific Payloads for Space Science Experiments – Thailand's Geographical Information and Space Technology Development Agency (GISTDA)

SPB-02 Scientific Mission Coordination and Flight Management to the International Space Station (ISS) - Thailand's Geographical Information and Space Technology Development Agency (GISTDA)

Conceptual Design of a Sub-Orbital Launching Vehicle for Small Payloads – MAIDANA RESEARCH & GISTDA

Design and Development of Demonstration micro-Satellites (CubeSats) for Education and Training

Project, Engineering and Scientific Management | Research, Design and Development | Innovation | Advanced Concepts | Informatics & Communications Technology | Software engineering | Electronics, Instrumentation and Control Systems | 3D Printing Technologies | Fabrication Methods | Computer Aided Manufacturing (CAM) | Space Systems and Instrumentation | Government – Industry partnership | Proposal writing | Engineering design | CAD/CAE/CAM | Optimization.

OWNER
CubeSat Solutions
Micro-Satellites and Small Launching Vehicles,
Pre-Start-up Venture – June 2021 (merged with ESS)
www.cubesat-solutions.com

CubeSat Solutions has the goal of developing, launching and operating low weight satellites offering worldwide turnkey solutions for the small satellite industry. A unique integral low-cost service provider for the construction of small satellites and exploitation of satellite services for any business willing to gain access to orbit.

Task:

- Oversee the development of sub-orbital rockets and micro-satellites for missions to low-Earth Orbit.

- Company general management and strategic planning

- Examination of the short and long term needs of the organization, utilizing capital to make investments designed to help the organization reach its objectives

Keywords: engineering design | R&D | small satellites | cubesats | tubesats | rockets | sub-orbital launching vehicles | project management | business administration | business management | government relations |

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TENURED LECTURER IN MECHANICAL ENGINEERING, 2013 – 2016
Chiang Mai University, Faculty of Engineering, Chiang Mai - Thailand

RESEARCH
Basic and applied research on space, nuclear and mechanical systems engineering. Applied, industrial and engineering physics. Multi-physics & engineering analysis.

TEACHING
Course management, administration and teaching in mechanical and aerospace engineering:

- Mechanics of Machinery I: basic mechanisms, force analysis, balancing of rotating and reciprocating members.
- Mechanics of Machinery II: intermediate level kinematics and dynamics of machinery, basic rotodynamics analysis, modeling and simulation of mechanisms using MATLAB & Simulink.
- Mechanics of Solids I & II: stress, strain, and mechanics of materials. Structural and stress analysis using AutoDesk Inventor / Simulation Mechanical.
- Engineering Dynamics II: 3D dynamics of rigid bodies and its engineering applications. Multibody dynamics. Modeling.
- Rocket and Propulsion Engineering: aerospace propulsion - aircraft, rocket and spacecraft propulsion - mission analysis.
- Introduction to aerodynamics and aeronautical engineering

ACADEMIC DEVELOPMENT:
Curriculum and e-learning development in aerospace and mechanical engineering. Development of instructional laboratories. Participation and organization of seminars and conferences. Publication of research and review papers. Academic and professional guidance and advice of students and non-students. General outreach activities. ABET accreditation.

TECHNICAL COORDINATION & SUPERVISION
Supervision and guidance on the design, integration, testing, operation and maintenance of complex electronic and mechanical systems and sub-systems.

Capstone project coordination: Design and construction of unmanned aircraft vehicles (UAV).

BUSINESS DEVELOPMENT:
Funding acquisition. Administration of resources. Contracting, grant proposal writing and technical coordination. Development of academic, industrial and international collaborations.

PRINCIPAL INVESTIGATOR
Lead researcher and project manager with direct responsibility for completion of the funded project, directing the research and reporting directly to the funding agency.

INDUSTRY CONSULTANCY / TECHNOLOGY TRANSFER

Mid-career Investigator Research Grant Award 2015.

Keywords: energy and propulsion | aerospace propulsion | unmanned aircraft systems | rocketry | cubesats | space nuclear systems | nuclear power | mechatronics | machinery | systems engineering | dynamical systems | thermo-fluids | electrodynamics | magnetohydrodynamics | modeling | simulation | multiphysics analysis |

computer aided engineering design | optimization | software engineering | instrumentation and control | electronic interfaces | applied engineering | project management | technical coordination | procurement | higher education | e-learning | science writing | technology transfer |

AFFILIATE FACULTY IN MECHANICAL ENGINEERING, 2011 – Present
Idaho State University, Pocatello, Idaho – United States of America

Independent research, project consulting, public speech on science, technology, engineering and mathematics (STEM), seminar guest speaker.

Graduate Thesis Committee Member: Kean Martinic
Program: Nuclear Engineering Masters Program
Topic: Nuclear Micro-Reactors | Accelerator Driven Sub-Critical Systems (ADSS)

SENIOR CONSULTANT, 2014 – 2016
AWR Lloyds, Bangkok, Thailand

Consulting services, primarily in the Asia-Pacific area, in topics related to industries and advanced technologies deemed critical to national security and to long term economic development including aerospace, remote sensing technologies, satellites, nuclear technologies, defense-related industries, advance energy and materials technologies and some natural resources (e.g. rare earths) and infrastructure-related sectors.

NUCLEAR & FUTURE FLIGHT PROPULSION TECHNICAL COMMITTEE
Senior Member – Former Treasurer and Liaison sub-committee Chair
American Institute of Aeronautics and Astronautics, AIAA – United States, 2010 – current

Conduct activities toward the understanding of physical mechanisms and associated technologies that lead to the implementation and design of nonchemical, high energy aerospace propulsion systems.

- Technical and political analysis
- Public policy and Community outreach
- Government and regulatory affairs
- Public speaker

SCIENTIFIC COMMITTEE MEMBER, 2011 – 2015
Mars Society Switzerland – Neuchatel, Switzerland

Works to educate the public, the media and government of the benefits of exploring the red planet and outer space. Advice in questions related to space science and technology with emphasis in space nuclear systems, advanced propulsion systems and mission planning.

- Technical analysis
- Community outreach
- Public policy and administration
- Public speaker.

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SENIOR RESEARCH FELLOW – APPLIED PHYSICIST, 2010 – 2013

European Organization for Nuclear Research, CERN – Geneva, Switzerland

Scientific and technical research in applied physics. Performance evaluation on machine protection and electrical integrity for large scale high energy physics facilities. Appointed scientific secretary in *Operations and Machine Protection* with co-responsibility over the organization of meetings and workshops, coordination of activities, review of technical documents, and scientific / technical presentations. Modeling and simulation of scientific instrumentation, advanced engineering components and physical process.

- Software Benchmarking and Analysis: PLACET Development Team – Alpha user.

- Operation, protection and failure analysis for a future 50 km/31 mi long, 3 TeV energy, multi-billion euros large scale research facility (CLIC)
- Advanced software operation (alpha user) and benchmarking (beta tester) of software for the design of highly complex devices
- Scientific and technical writing of research papers, technical documents and participated in the elaboration of the technical design report
- Research involving electrodynamics, thermal and structural analysis, computational methods, electromagnetics, radiation damage and system integration (850+ modules valued 1 MEURO each, operating in the energy range 9 GeV to 3 TeV, high vacuum, high current, high magnetic fields, high radiation environment, 20 nano-meters alignment tolerance, high intensity electron / positron beams)
- Safety engineering. Risk and failure analysis. System safety and safety systems.

RESEARCH ASSOCIATE – SPACE NUCLEAR SYSTEMS, 12/2007 – 10/2010

Idaho National Laboratory, Idaho Falls, Idaho – United States

National Aeronautics and Space Administration, NASA and U.S. Department of Energy, DoE

Research and development on space nuclear systems and associated technology for robotic and human space exploration missions in support of NASA and the Constellation program. Design engineer of thermo-magnetic systems for nuclear power based space missions (primary area: fission surface power, secondary area: nuclear propulsion).

- Design, modeling, simulation, fabrication, testing and optimization of advanced engineering devices.
- Scientific and technical writing of research papers, technical documents and reports. Participation in conferences and presentations. Public speaking.
- Research and technical activities involving computational and experimental electromagnetics, fluid dynamics, thermodynamics, heat transfer, stress analysis, magnetohydrodynamics (MHD), radiation damage, power electronics (e.g. 3-phase AC), mechanical and electric design, fabrication methods, system integration, thermo-hydraulics, measurements and instrumentation.
- International expert on the design of liquid metal annular linear induction pumps.

Security Clearance: DoE / BEA "C – Confidential" – 5 years background check investigation. GS13.

RESEARCH ASSOCIATE – NUCLEAR FUELS & MATERIALS, 9/2009 – 9/2010

Idaho National Laboratory, Idaho Falls, Idaho – United States

Managed by Battelle Energy Alliance for the U.S. Department of Energy

Research and development on nuclear fuels and materials. Performance evaluation on projects for the

Reduced Enrichment for Research and Test Reactors (RERTR) Program. The Reduced Enrichment for Research and Test Reactors (RERTR) Program develops technology necessary to enable the conversion of civilian facilities using high enriched uranium (HEU) to low enriched uranium (LEU) fuels and targets. The main technology components of the program are: the development of advanced LEU fuels; the design and safety analysis for research reactor conversion; and the development of targets and processes for the production of the medical isotope Molybdenum-99 with LEU.

- Nuclear Fuels and Materials Division
- Fuel Performance and Design
- Irradiation, phase reversion, heat treatment, stability and microstructural studies
- U - 10% Mo fuel alloys.

Security Clearance: DoE / BEA "C – Confidential" – 12 years background check investigation.GS-13.

INSTRUCTOR OF ELECTRONICS / Organization Liaison, 2010 – 2010
International Committee for Future Accelerators, ICFA – Fermilab / CERN
Instituto Balseiro, Bariloche – Argentina
School of Instrumentation 2010

Teaching of laboratory of electronics to professional and graduate students with emphasis in measurements and instrumentation. Co-instructor of laboratory of data acquisition and SCADA systems.

International organization and coordination of activities in the United States and in Argentina including logistics, resources availability, supervision of activities, air and ground transportation, security checks and medical services access.

The ICFA Instrumentation school offers to the students a unique formula that has, by now, become a tradition. Lecture courses in the morning, covering different topics in particle physics instrumentation. Courses are given by researchers who are actively involved in the field and who are recognized to be experts in detector development. The lecture courses are supported by afternoons of "hands-on" participation in laboratory experiments designed to demonstrate the material presented. ICFA school is a truly international school open to a maximum of 80 students from all over the world.

- Electronic measurements and development of instrumentation
- Technical coordination.
- Operations & personnel management (English / Spanish)

RESEARCH ASSISTANT – ENGINEER PHYSICIST, 1/2005 – 12/2007
Idaho State University, Pocatello, Idaho – United States

Research on applied physics and engineering for the U.S. DoE and the U.S. DHS.

Cargo Inspection: Over the last several years, there has been a substantial research and development effort into active inspection technologies that can non-destructively detect, identify and quantify fissionable materials for advanced nuclear materials safeguards applications with the long-term goal of providing near real-time nondestructive quantification of fissionable materials that can be deployed in field settings.

Electron sources: Software development for the mechanical design and analysis of electron sources.

Reactor-Accelerator Coupling Experiments - Accelerator Driven Sub-critical Systems: The RACE Project, a university transmutation research project of the U.S. Advanced Fuel Cycle Initiative (AFCI), was a series of accelerator-driven subcritical systems (ADSS) experiments. In these experiments, an electron accelerator

was used to induce bremsstrahlung photoneutron reactions in heavy-metal targets producing a neutron source to initiate fission reactions in the subcritical systems.

- Software Benchmarking and Analysis: MCNPX Beta Team - Los Alamos National Laboratory (LANL), USA
- Software Benchmarking and analysis: ASTRA Alpha User - Deutsches Elektronen-Synchrotron (DESY), Germany

- Research and technical activities involving microwave linear accelerators, computational beam physics, computational & experimental electromagnetics, RF cavities, metrology, radiation transport / shielding, design engineering and measurements.
- Scientific software development
- Design, modeling and simulation
- Scientific and technical writing of research papers, technical documents and reports. Participation in conferences and presentations. Public speaking. Posters design and presentation.

GRADUATE DESIGN ENGINEER – Wind Tunnel Instrumentation, 1/2007 – 7/2007
Idaho State University, Measurements & Control Engineering Research Center, Pocatello, ID – USA

Research and development of measurement and control systems for thermo-fluids and vibrations. Construction and operation of a sub-sonic wind tunnel and its optical and electronic instrumentation**.**

- Design, development, integration and testing of advanced optical (3D PIV – Particle Image Velocimetry) and electronic (LiF - Laser Induced Fluoresce) instrumentation including, but not limited to, CCDs, pulsed lasers, optical elements, electronic components, and computer interfaces.
- Design of structural elements (mounting systems for instrumentation) and integration of operational elements (smoke generator).
- Software selection, installation, operation and benchmarking for data acquisition and image processing.
- Benchmarking of results and co-development of computational fluid dynamics (CFD) models and simulations.

ENGINEER PHYSICIST – Combustion, 6/2004 – 12/2004
Michigan State University, Depart. Of Mechanical Engineering, East Lansing, MI – USA

Research on microgravity combustion, spacecraft fire safety and diverse aspects of combustion physics under contract for NASA. Providing simplified descriptions of complicated phenomena for combustion in microgravity environments with applications in mission safety and propulsion.

- Image processing, pattern recognition, data analysis and computational fluid dynamics (CFD)
- Combustion physics (including thermodynamics, heat transfer, fluid dynamics, thermo-chemistry, fluid-solid interaction)

MECHANICAL ENGINEER & COMPUTER SCIENCE SPECIALIST –
SR TEACHER ASSISTANT /INSTRUCTIONAL SECTION LEADER, 8/2004 – 12/2004
Michigan State University, Depart. Of Mechanical Engineering, East Lansing, MI – USA

Teaching of 2 sections of engineering thermodynamics (Dept. of Mechanical Engineering) and 1 section of computer science for non-engineering majors (in-loan to the Department of Computer Science).

Coordination of activities between teaching assistants, section leaders, students and the faculty (over 1200

persons).

- Supervision and coordination of activities
- Scheduler and controller. Administrative liaison
- Operations and personnel management (direct supervision on over 180 persons)

TECHNICAL CONSULTANT / INFORMATION ANALYST, 3/2004 – 8/2004
Enerficiency, LLC - East Lansing, MI – USA

Acquisition and analysis of data and information on renewable energy sources (Solar, Hydro-electric and PEM Fuel Cells) technology, local and regional market, business involved or with potential involvement, commercialization perspectives, parts and components providers. Industry Liaison.

- Business intelligence
- Information analysis

RESEARCH ASSISTANT – PHYSICIST, 2/2002 – 7/2004
Michigan State University, Depart. of Physics and Astronomy - East Lansing, MI – USA

Research on applied physics. Modeling, simulation, optimization and validation of scientific-technical designs for high energy physics. Scientific software benchmarking and analysis.

Virtual university system administration: Server administration and system operation. Networking and communications systems (10/100, 1Gbit, ISDN, fiber optics, video-conference, routers, hubs, cabling). Systems Engineering. Functional and system analysis. Web page design. Maintenance and installation of software and hardware.

Teacher assistant on advanced, specialized and professional subjects on physics and applied physics at masters and doctoral levels.

- Software benchmarking and analysis: COSY Development Team. Alpha User & Beta Tester.
- COSY INFINITY is simulation and analysis code which allows the study of particle accelerators, astrodynamics and control, guidance systems, electron microscopes, and many other devices.

- Design, modeling and simulation
- Scientific and technical writing of research papers, technical documents and reports. Participation in conferences and presentations. Public speaking. Posters design and presentation.
- Research and technical activities involving computational electromagnetics, dynamical systems, electrodynamics, and computational / mathematical physics.
- Virtual university system administration and e-learning
- Informatics and Communications Technology

TECHNICAL INTERN – GUDANCE, SIMULATION & CONTROL SYSTEMS, 1999 – 2000
Institute for Scientific and Technical Research of the Armed Forces, CITEFA - Argentina

The Institute for Scientific and Technological Research of the Armed Forces (CITEFA, Spanish: Instituto de Investigaciones Científicas y Técnicas de las Fuerzas Armadas), is an Argentine federal agency in charge of the research, development and homologation of armament. The Agency was moved under the orbit of the Ministry of Defense and renamed Institute for Scientific and Technological Research for the Defense - Instituto de Investigación Científicas y Técnicas para la Defensa- (CITEDEF). CITEFA has produced several air-to-surface missiles since late 1960s including the Albatros, the Martin Pescador and the AS-25K.

In 2008 they refurbished the Aspide's missile engines in use in the Argentine Navy and Matra Magic air-to-air missiles.

- Software development, computational physics, modeling and simulation
- Flight mechanics. Guidance and control.
- Defense systems

INFORMATICS & COMMUNICATIONS TECHNOLOGY - INSTRUCTOR , 7/1994 – 11/2001

Several elementary, middle and high schools – Buenos Aires, Argentina

Teaching of informatics technology (IT) to high school students (junior and senior year/4th and 5th year) - Classroom and laboratory. (1999-2001). Teaching of basic computer operation concepts to elementary school students (1995 - 2000) and teaching of computer operation and administrative//office software to adults assisting evening school. (1994 - 1996).

Curriculum development: Creating a planned curriculum, pedagogy, instruction and presentation modes specifying the way content is delivered, including the structure, organization, balance, and presentation of content in the laboratory-classroom. (1995 & 1999).

- Informatics and communications technology (ICT)
- Curriculum development. Classroom education
- Personnel management and coordination of activities

INFORMATICS TECHNOLOGY & MANAGEMENT INFORMATION SYSTEMS - LABORATORY & OPERATIONS MANAGER, 4/1999 – 12/2001

Several district schools – Buenos Aires, Argentina

Performed administration, installation and maintenance of computers, computer networks (LAN/WAN) and software at elementary and secondary education schools for instructional tasks and for support of everyday operations. Management information systems.

- Informatics and communications technology (ICT)
- Management information systems
- Personnel management and coordination of technical, maintenance and instructional activities

APPLIED INFORMATICS SPECIALIST - AUTOMATION & ROBOTICS LABORATORY AND TEACHER ASSISTANT, 7/1999 – 11/1999

Universidad Tecnologica Nacional, INSPT - Argentina

Laboratory and teacher assistant in computer programming for automation and robotics. Jr software developer (intern) for e-learning of technical, industrial and basic science subjects.

- Informatics and communications technology (ICT)
- Data acquisition and control using PCs
- Programming

TECHNICAL INTERN - MATERIALS ENGINEERING, 6/1999 – 9/1999
Argentinean Commission for Atomic Energy, CNEA – Argentina

Education and practical training in materials science and engineering.

VOLUNTEER EXPERINCE & CAUSES

INFRAESTRUCTURE & HEALTH MANAGEMENT SERVICES / EMERGENCY RESPONSE
Public Health Organizations - Northern Thailand (5/2013 – 12/2014)

Assisting in infrastructure assessment and cost planning. Assisting in the development of presentations and policies before the local and regional governments. Assisting in health management services as requested and needed. Assisting in logistics and transportation during night-shift emergency cases. Security and safety assessment. Co-organization of social and professional development events. Technical consultant on medical technology, medical devices, health-care software, informatics and civil infrastructure.

STEM COUNSELOR / SCHOLARSHIP ADMINISTRATION
Public schools and universities (August 2013 – December 2015)

Provided counseling in education and career options in science, technology, engineering and mathematics. I administered, provided and personally funded partial and total scholarships to economics and social disadvantaged students during critical periods of their studies (and life) in under-developed countries.

INTERNATIONAL DEVELOPMENT / SCIENCE, EDUCATION, ICT
Public schools, community colleges, health centers and universities (April 2008 –Current)

International development is related to the concept of international aid, but is distinct from, disaster relief and humanitarian aid. While these two forms of international support seek to alleviate some of the problems associated with a lack of development, they are most often short term fixes — they are not necessarily long-term solutions. International development, on the other hand, seeks to implement long-term solutions to problems by helping developing countries create the necessary capacity needed to provide such sustainable solutions to their problems. A truly sustainable development project is one which will be able to carry on indefinitely with no further international involvement or support, whether it is financial or otherwise.

- Development of science, technology and international cooperation at universities in developing

countries.
- Development of new and updated content for science, technology, and engineering (STEM) education at elementary, secondary, vocational and higher education institutions.
- Advice on the modernization and incorporation of technologies on the health and educative sector
- Public speech and counselling

INFORMATICS & COMMUNICATIONS TECHNOLOGY

RESOURCES MANAGEMENT – INFRASTRUCTURE PLANNING AND DEVELOPMENT

COMPUTER SOFTWARE & HARDWARE
• Advanced computer programming • Advanced software operation • Multimedia technology • Hardware assembly, maintenance and programming • Multiplatform: PCs, workstations, servers, mainframes, clusters • IT security at software and hardware level • Web design

NETWORKING AND COMMUNICATION SYSTEMS:
• Structured cabling. Communication boards. Hubs & routers. Antennas. • Installation, configuration and administration of computer networks • Digital communication systems • Point-to-point and Point-to-multipoint communication links • Design, Maintenance and Management of integrated networks

MANAGEMENT INFORMATION SYSTEMS
• School information management systems • Office automation systems • Decision support systems • Knowledge management systems • Systems analysis, design, implementation, testing, conversion, documentation and maintenance

SCIENTIFIC COMPUTING
• Software engineering • Mathematical modeling and simulation • Data analysis. Optimization • Benchmarking (Alpha user. Beta tester) • Visualization. Graphical user interfaces, GUIs. • High performance computing (HPC) • Data Science

DATA ACQUISITION, PROCESS CONTROL & EMBEDDED SYSTEMS
• Supervisory control and data acquisition, SCADA • PC data acquisition and instrumentation • Computer controlled solutions • Data analysis. Low level programing • Embedded and control systems

Experience: 25+ years.

PROFESSIONAL AFFILIATIONS

- American Institute of Aeronautics and Astronautics, AIAA (Lifelong and Senior member)
- American Physical Society, APS (former)
- Institute of Electrical and Electronics Engineers, IEEE (former)
- Project Management Institute, PMI (former)
- Argentinean Navy Reserve

TEACHING EXPERIENCE

Graduate level:

- Analytical mechanics
- Introductory beam physics
- Particle accelerators I & II
- Non-linear beam dynamics (Dynamical systems. Optimization. High order non-linearities)
- Electronics laboratory.
- Control and data acquisition.

Professional level:

- Orbital mechanics
- Mission analysis
- Introduction to rocket engineering

Undergraduate level:

- Mechanics of machinery I & II
- Rocket & propulsion engineering (aerospace propulsion)
- Engineering dynamics II
- Mechanics of solids I & II (aka mechanics of materials and stress analysis)
- System analysis and control
- Engineering thermodynamics
- Fluid mechanics I
- Computer science I for non-engineering majors
- Computer programming for Automation and Robotics majors
- Theoretical physics I: mechanics
- Theoretical physics II: electromagnetics
- Applied electromagnetics
- General physics I, II & III

Secondary/High school/Vocational level:

- Informatics Technology I & II. Computer science laboratory.
- Physics. Mathematics. Electric circuits and machines.

Military instruction:

- Basic training

Dr. Carlos O. Maidana

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OTHERS

- Space Generation Advisory Council – U.N. Programme on Space Applications
- Korean TaeKwonDo Association, 2009/10
- International Taekwondo Federation
- American Pool Leagues Association (APA), 2009/10
- Top 24 LinkedIn profiles in research commercialization, Top 10% between peers
- Former international civil servant (with diplomatic status)
- Interests in billiards, martial arts, photography, international relations, political science
- Space exploration, exploitation and commercialization advocate
- Business development consultant

PUBLICATIONS

BOOKS / BOOKLETS : 4

1. "Thermo-magnetic systems for space nuclear reactors: an introduction" by Carlos O. Maidana. Springer briefs in applied sciences and technologies, Springer U.S., 2014. ISBN 978-3-319-09029-0.
2. "Design of a Cabinet Safe System for a portable particle accelerator – Electromagnetic optics and beam dynamics optimization. Basics, concepts and methods" by Carlos O. Maidana. VDM Verlag, Germany, 2009. ISBN 978-3-639-15901-1.
3. "Elements of Aerospace Propulsion and Spacecraft Engineering: aircrafts, rockets and spacecrafts" by Carlos O. Maidana. Springer U.S., 2020/2021 – Work in progress.
4. "Elements of Mechanics of Machinery" by Carlos O. Maidana, 2020/2021– Work in progress.

LECTURE NOTES / LECTURE PRESENTATION MATERIAL : 4

1. Title: "Mechanics of Machinery I". Chapters: 12. Author: Carlos O. Maidana. Year: 2015
2. Title: "Mechanics of Machinery II". Chapters: 8. Author: Carlos O. Maidana. Year: 2015
3. Title: "Engineering Dynamics II". Chapters: 12. Author: Carlos O. Maidana. Year: 2015
4. Title: "Rocket and Propulsion Engineering". Chapters: 18. Author: Carlos O. Maidana. Year: 2015

REFEREED SCIENTIFIC PAPERS & TECHNICAL ARTICLES : 27

NON-REFEREED PUBLICATIONS: 4

PUBLIC PRESENTATIONS: 20+

PATENTS: 10 (Including Provisional Patent Applications / Patent Pending)

1. Annular Linear Induction Pumps for Molten Salts and Liquid Metals
   Patent date filed Jun 23, 2020
   Patent issuer and number US 63/037,831
2. Active Flow Control of Linear Induction Electromagnetic Pumps using Machine Learning
   Patent date filed Jun 17, 2020

Patent issuer and number US 63/038,813

3. Micro-Channel Cooling System for Electromagnetic Pumps
   Patent date filed Jul 27, 2020
   Patent issuer and number US 63/057,170
4. Software for the Design and Analysis of Annular Linear Induction Pumps
   Patent date filed Jul 7, 2020
   Patent issuer and number US 63/045,161
5. Experimental Module for the Investigation of Plant micro-Tuberization under micro-Gravity Conditions
   Patent date filed April 2021
6. Experimental Module for the Investigation of Fluid Homogenization under micro-Gravity Conditions
   Patent date filed April 2021
7. Experimental Module for the Investigation of Bacteria under micro-Gravity Conditions
   Patent date filed April 2021
8. Experimental Module for the Investigation of Water-Meal Plants under micro-Gravity Conditions
   Patent date filed April 2021
9. 3D Printed Payload Enclosure for Space Science
   Patent date filed April 2021
10. Nuclear Micro-Reactor using an Accelerator-Driven Subcritical Assembly
    Patent date filed April 2021

OTHER PROFESSIONAL SERVICE

- Journal of Space Exploration. Reviewer/referee, 2013 - current
- NASA - Experimental Program to Stimulate Competitive Research (EPSCoR), SME – Reviewer, 2015
- NASA – U.S. National Aeronautics and Space Administration. Registered reviewer on NASA Innovative Space Concepts (NIAC), 2011
- Annals of Nuclear Energy, Elsevier. Reviewer/referee, 2010-current
- Journal of Nuclear Engineering and Technology (Elsevier)
- U.S. Department of Energy – Office of Nuclear Engineering - Small Business Innovative Research
- Journal of Radioanalytical and Nuclear Chemistry, Springer (2015)
- International Science Grid this week, iSGTW. Collaborator. Consultant, 2012-2013. A U.S. National Science Foundation and E.U. FP7 publication
- Nuclear Instruments and Methods in Physics Research, A. Reviewer/referee, 2010
- European Union registered reviewer, 2014 - current
- Several National & International Organizations. Project and grant proposals evaluation. Financing, risk and reliability analysis.
- ICFA School on Instrumentation in Elementary Particle Physics. Co-instructor of Basic Electronics Laboratory, 1/2010
- 6th International Conf. for Applications of Particle Accelerators – AccApp'07 (USA). Assistant to the organizing committee. Referee: 4 papers reviewed. Session co-chair (two sessions)

Dr. Carlos O. Maidana

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REFERENCES

- Dr. Marco P. Schoen, Professor and former Chair, Department of Mechanical Engineering; Associate Director of the Measurements and Control Engineering Research Center; College of Science & Engineering, Campus Box 8060, Pocatello, ID 83209-8060, USA. Phone: +1 (208) 282-4377. E-mail: schomarc@isu.edu
- Dr. James Moran, Assistant Professor, Chiang Mai University, Department of Mechanical Engineering, 50200 Chiang Mai, Thailand. E-mail: james@dome.eng.cmu.ac.th
- Dr. Jose Alberto Rodriguez, Staff Physicist | Section Head and Project leader – European Organization for Nuclear Research. Email: jose.alberto.rodriguez@cern.ch | Phone: +41 22 76 72607
- Dr. Adam Lichtl, Physicist. Former Director for Research, Space Exploration Technologies (Space-X) and Founder of Delta Brain, Inc. E-mail: adam.c.lichtl@gmail.com
- Jean-Daniel Sciboz, KCHK Co-Founder and former Vice-President for Management, Swiss Space Systems, E-mail: jd@keycapital.com.hk
- Dr. Shashikant Manikonda. Research Scientist at Advanced Magnet Lab, Palm Bay, Florida, USA. E-mail: manikond@gmail.com, phone: +1 (630) 506-0714.
- Dr. Elaine Kwan, Research Staff Member, Facility for Rare Isotope Beams (FRIB), Michigan State University, East Lansing, MI 48824, phone: +1 (734) 812-0279. E-mail: kwan@nscl.msu.edu.