

## Oscar Martinez, Ph.D.

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Security Clearance: DOE Q clearance and SCI (2012–2015)

Citizenship: USA

**I am qualified for structural, thermal, and mechanical engineering analysis. I have leadership and project management experience as a group leader for the nuclear materials packaging, transportation, and system analysis group. I have exceptional research, analytical, written, and oral skills of basic and complex engineering tasks.**

I possess a strong technical background in solid mechanics, micromechanics, structural analysis, finite element analysis, and design of composite and metallic structures. I have experience in working with prototype, flight, and test hardware from conception to manufacturing. I have led and managed and guided a team of engineers, designers, technicians on the regulatory testing of type B shipping packages that contain radioactive material, and explicit dynamic analysis of the advanced space suit. I have a history of research, analytical, written, project management, and oral skills and have published journal papers in the *American Institute of Aeronautics and Astronautics (AIAA) Journal*, worked on research and development projects, and presented and published papers at technical conferences (AIAA, American Society of Mechanical Engineers (ASME), and American Society of Composites (ASC)).

### Education

- ◆ **Doctor of Philosophy, Aerospace Engineering**, University of Florida, Gainesville, Florida, May 2007.  
**Ph.D. Dissertation title:** Micromechanical Analysis and Design of an Integrated Thermal Protection System for Future Space Vehicles (ITPS). <http://purl.fcla.edu/fcla/etd/UFE0019802>
- ◆ **Master of Science, Aerospace Engineering**, University of Florida, Gainesville, Florida, August 2004.  
Focus on solid mechanics, design and manufacturing of composite materials.
- ◆ **Bachelor of Science, Aerospace Engineering**, University of Florida, Gainesville, Florida, May 2003.  
**Graduated Cum Laude**

### Professional Skills

#### Computer Programs

- ◆ LS-DYNA, ANSYS, Matlab, STAAD, ABAQUS, FEMAP, AutoCAD, NASTRAN, FORTRAN, MathCad, ProE

#### Technical Summary

- ◆ Fracture Mechanics
- ◆ Advanced Composite Materials/Analysis
- ◆ Thermal Mechanical Analysis
- ◆ Finite Element Analysis (FEA)
- ◆ ASME B&PVC, ASTM,
- ◆ High Speed Impact Analysis
- ◆ Thermal Protection Systems
- ◆ Micromechanics and Classical Plate Theory

### Professional Awards

- ◆ Jacobs Engineering Spot Award for excellent work on the Advanced Space Suit Project and the Multi Purpose Crew Vehicle project (2009, 2010, 2011)
- ◆ Award of Excellence in support of the Portable Life Support System for the Constellation Program from NASA Johnson Space Center. (2009)
- ◆ ORNL Significant Performance Award (2014, 2019, 2020)

## Professional Experience

### Oak Ridge National Laboratory, Knoxville, Tennessee

2011–present

#### Senior Research and Development Staff and Group Leader

- ◆ Group Leader for the Nuclear Materials Packaging, Transportation, & Systems Analysis group
- ◆ Program Manager, Project Manager, Operations Manager, Test Director for the testing of Type B and other radioactive material shipping packages.
- ◆ Utilized FEA tools such as LS Dyna, ANSYS, and ABAQUS to perform and guide technical analysis and experiments.
- ◆ Developed the Packaging Testing Program Development and Quality Assurance Program.
- ◆ Control Account Manager for the Spallation Neutron Source Proton Power Upgrade Project.
- ◆ Individual contributor and subject matter expert to various projects in mechanical engineering, FEA, design, manufacturing, and structural analysis.
- ◆ Lead engineering analyst on dynamic assessment of various mechanical systems and components.
- ◆ Lead a team of matrixed staff members to complete complex project tasks.

### Jacobs Engineering, Houston, Texas

2008–2011

#### Senior Aerospace Structural Analysis Engineer

- ◆ Structural Analysis Technical Lead engineer for the stress analysis group of the Advanced Space Suit Personal Life and Support System (PLSS).
- ◆ Responsible for all stress analysis tasks, deadlines, milestones, technical quality, and deliverables to the customer of the PLSS project.
- ◆ Coordinated the design activity schedule with the stress analysis schedule, 95-100% of all activity was kept within schedule for the last two years.
- ◆ Performed structural/stress analysis on various metallic and composite test articles, ground support, and flight hardware for various projects.
- ◆ Demonstrate through analysis the thermal protection system concept for project Orion due to reentry, pad abort, and cold soak temperatures.
- ◆ Developed, verified, and demonstrated advanced light-weight structural concepts that exploited composite materials and sandwich structures through analysis and test.
- ◆ Weekly interactions with customers, program managers, designers, analysts, and NASA affiliates.
- ◆ Prepared strength and fracture assessment reports to meet project milestones or deliverables on time and ahead of schedule.

### Alliant Techsystems (ATK), Salt Lake City, Utah

2007–2008

#### Structural Analysis Engineer

- ◆ Identified key failure mechanism in ATK's small launch vehicle and ATK's launch vehicle.
- ◆ Developed finite element analysis procedures and processes to be used in launch vehicle structural/stress analysis.
- ◆ Weekly interactions with the Systems Engineering and Integration engineers and the Physical Integration engineers.
- ◆ Defined launch vehicle models, analysis procedures, and design analysis reports to validate requirements and design.

## Academic Research Experience

### University of Florida (UF), Gainesville, Florida

2004–2007

#### Master's and Doctoral Research Assistant

- ◆ Identified key failure mechanisms in the Integrated Thermal Protection System's sandwich (ITPS) construction and developed analysis procedures that can be used in the design of the ITPS.
- ◆ Developed new methods or modified available methods to perform thermo-mechanical structural analysis of a full thermal protection system of use on a Crew Exploration Vehicle.
- ◆ Weekly interactions with Constellations University Institutes Project researchers.
- ◆ Worked in cooperation with optimization team with weekly design meetings in coordination with NASA Langley Research Center.

## Conference Proceedings

1. Martinez, O. A, Montgomery, R., Bevard, B., “Finite Element Evaluation of Spent Nuclear Fuel for Dynamic Impact Load Cases”, *2021 ANS Virtual Annual Meeting*, June 14-16, 20201, Virtual Online.
2. Martinez, O.A., Adeniyi, A., Nogradi, P., Loftin, B., Martinez, C., Van Hoy, B., “Regulatory Testing and Posttest Analysis of the DPP-3 Type B Shipping Container “ *Proceedings of the ASME 2021 Pressure Vessel & Piping Conference*, PVP-2021-62434, July 12-16, 2021, Virtual Online.
3. Martinez, O. A., “Regulatory Testing of a Type B Shipping Contained for NCT and HAC”, *Proceedings of the 19<sup>th</sup> International Symposium on the Packaging and Transportation of Radioactive Materials PATRAM 2019*, Paper Number 1393, New Orleans, Louisiana, August 4-9, 2019.
4. Martinez, O.A., “Special Form Testing of Sealed Source Encapsulations for High-Alpha-Activity Actinide Materials”, *Proceedings of the 18<sup>th</sup> International Symposium on the Packaging and Transportation of Radioactive Materials PATRAM 2016*, Paper Number 5044, Kobe, Japan, September 18-23, 2016.
5. Jarrell, J., Adeniyi, A., Martinez, O., Radulescu, G., Robb, K., Scaglione, J., “Design of Universal Canister System for U.S. High-Level Waste”, *Proceedings of the 18<sup>th</sup> International Symposium on the Packaging and Transportation of Radioactive Materials PATRAM 2016*, Paper Number 5044, Kobe, Japan, September 18-23, 2016.
6. Martinez, O.A., Blessinger, C.B., “ORNL Special Form Testing of Sealed Source Encapsulations”, *Proceedings of the 49<sup>th</sup> ASME Pressure Vessel and Piping Conference*, ASME PVP2015-46003, Boston, Massachusetts, July 19-23, 2015.
7. Feldman, M.R., Ludwig, S.B., Martinez, O.A., “Recent Radioactive Material Package Testing Experiences at Oak Ridge National Laboratory” *Proceedings of the 17<sup>th</sup> International Symposium on the Packaging and Transportation of Radioactive Materials PATRAM 2013*, San Francisco, California, August 18-23, 2013.
8. Sharma, A., Gogu, C., Martinez, O., Sankar, B., Haftka, R., “ Multi-Fidelity Design of an Integrated Thermal Protection System for Spacecraft Reentry” *49th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, Schaumburg, Illinois, April 2008, AIAA 2008-2062.
9. Martinez, O., Sankar, B.V., Haftka, R.T., “Thermal Response Analysis of an Integral Thermal Protection System for Future Space Vehicles,” *ASME International Mechanical Engineering Congress and Exposition*, Chicago, Illinois, November 2006, IMECE2006-14522.
10. Martinez, O., Sankar, B.V., Haftka, R.T., “Thermal Analysis of a Corrugated Core Sandwich Panel for Integral Thermal Protection System,” *American Society of Composites 21<sup>st</sup> Annual Technical Conference*, Dearborn, Michigan, September 2006, paper no. 219.
11. Bapanapalli, S.K., Martinez, O., Sankar, B.V., Haftka, R.T., Blosser, M.L., “Analysis and Design of Corrugated-Core Sandwich Panels for Thermal Protection Systems of Space Vehicles,” *47<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, Newport, Rhode Island, May 2006, AIAA 2006-1942.
12. Martinez, O., Bapanapalli, S.K., Sankar, B.V., Haftka, R., Blosser, M.L., “Micromechanical Analysis of a Composite Truss Core Sandwich Panel for Integral Thermal Protection Systems,” *47<sup>th</sup> AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference*, Newport, Rhode Island, May 2006, AIAA 2006-1876.
13. Martinez, O., Bapanapalli, S.K., Sankar, B.V., Haftka, R.T., “Analysis of a Corrugated Core Sandwich Structure for Integral Thermal Protection System,” *ASME International Mechanical Engineering Congress and Exposition*, Orlando, Florida, November 2005, IMECE2005-82822.

## Publications

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1. Martinez, O., Sankar, B.V., Haftka, R., Blosser, M.L. (2012), “Two-Dimensional Orthotropic Plate Analysis of an Integral Thermal Protection System,” *AIAA Journal*, 50(2), 387–398, DOI: 10.2514/1.J051172.
2. Martinez, O., Sharma, A., Sankar, B.V., Haftka, R., Blosser, M.L. (2010), “Thermal Force and Moment Determination of an Integrated Thermal Protection System,” *AIAA Journal*, 48(1), 119–128, DOI: 10.2514/1.40678.
3. Martinez, O., Sankar, B.V., Haftka, R., Blosser, M., Bapanapalli, S.K. (2007), “Micromechanical Analysis of a Composite Corrugated-Core Sandwich Panel for Integral Thermal Protection Systems,” *AIAA Journal*, 45(9), 2323–2336, DOI: 10.2514/1.26779.
4. Martinez, O. (2007). “Micromechanical Analysis and Design of an Integrated Thermal Protection System for Future Space Vehicles”, Ph.D. Dissertation, University of Florida, Gainesville, Florida, [http://etd.fcla.edu/UF/UFE0019802/martinez\\_o.pdf](http://etd.fcla.edu/UF/UFE0019802/martinez_o.pdf).
5. Bapanapalli, S. K., Martinez, O. M., Gogu, C., Sankar, B. V., Haftka, R. T., and Blosser, M.L., “Analysis and Design of Corrugated Core Sandwich Panels for Thermal Protection Systems of Space Vehicles,” *AIAA Journal*, 2006–1942, 2006.