



# Press Release

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## **Dr. Karen E. Jackson Selected for Prestigious 2017 AHS Alexander A. Nikolsky Honorary Lectureship**

**Fairfax, VA** – AHS International — *The Vertical Flight Technical Society* — announced today that Dr. Karen E. Jackson, a senior aerospace engineer for the Structural Dynamics Branch at NASA Langley Research Center in Hampton, Virginia, USA, has been selected for the prestigious 2017 Alexander A. Nikolsky Honorary Lectureship. The Lectureship is awarded to “an individual who has a highly distinguished career in vertical flight aircraft research and development and is skilled at communicating technical knowledge and experience.”

Dr. Jackson was chosen in recognition of her contributions over a 35+ year career in the field of structures and survivability. She is a world-class authority on structural impact and crashworthiness, and her research is internationally recognized as some of the most significant in this area. She will present the 37th Annual Nikolsky Honorary Lecture, “Advances in Rotorcraft Crashworthiness — Trends Leading To Improved Survivability,” at the 73rd Annual AHS International Forum and Technology Display on May 9, 2017. This is the first time that crashworthiness has been selected as a Nikolsky Lecture.

Jackson began her career at the US Army Aeromechanics Laboratory at Ames Research Center (now part of the Army’s Aviation Development Directorate, ADD) in 1981 after completing her Bachelor of Science degree at the University of Tennessee. Shortly thereafter, she transferred to the Army laboratory site at the Langley Research Center (also now part of ADD). Jackson completed her Master of Science degree at Virginia Tech in 1984 and earned her Ph.D. in Engineering Mechanics from Virginia Tech in 1990. Her doctoral work focused on scaling effects in composite materials and became the catalyst that focused her research interest in two areas: scaling characteristics of composite materials and the application of composite materials to aircraft crashworthiness.

During her tenure at the Langley Research Center, Dr. Jackson has been on the forefront of research in crash modeling and simulation. She led the effort for the Army Science and Technology Objective (STO) in Crash Modeling and Simulation in the mid-1990s. This effort was a four-year project that evaluated state-of-the-art simulation codes, developed a finite element model of the Sikorsky Advanced Composite Airframe Program (ACAP) helicopter, conducted a full-scale crash test of the airframe, and validated the simulation methodology through extensive test/analysis correlation. This effort was the first time a full-scale crash simulation was developed using an explicit, nonlinear, transient dynamic finite element analysis. The work was recognized by the Army Research Lab in 1999 with an award for Technical Achievement in Engineering. Jackson’s research in this area has been the basis for work by many others.

Subsequent to this research effort, the application of dynamic simulation codes within the rotorcraft industry and the aerospace community at large has increased exponentially to solve a wide range of impact problems, from bird strikes to fan blade containment to multi-terrain crashes.

Jackson has made many contributions to the field of impact dynamics, crashworthiness and crash safety. She has authored 24 papers on the topic of scaling effects in composite materials. Research in this area led to the modification of the ASTM International standard test method for determination of shear modulus and strength properties for composite materials.

Through an Army exchange program, Jackson spent time at the UK Defence Evaluation and Research Agency (now the Defence Science and Technology Laboratory, Dstl) in 1995 to conduct further research in scaling effects for composites. She is the co-inventor of a crush test fixture that was awarded a US patent for determination of the energy absorption capabilities of composite laminates. In addition, she served as a liaison for the Army's Full Spectrum Crashworthiness program to establish new crashworthiness criteria for military helicopters.

Jackson also conducted research to develop improved energy absorbing material and construction methods for airframes. She led a team that developed a retrofit subfloor to improve the crashworthy characteristics of a fuselage section, and also developed an innovative fuselage section concept fabricated using composite sandwich construction to form a stiff and strong cabin. The fuselage section has become a testbed for research programs that have studied seat/occupant test and analysis correlation, and a multi-terrain impact study that was conducted with the rotorcraft industry, which was honored in 2003 with the AHS Harry T. Jensen Award, "given in recognition of an outstanding contribution to the improvement of rotorcraft reliability, maintainability, or safety through improved design".

In 2006, Jackson transferred to NASA and continued to conduct rotorcraft crashworthiness research. The research focuses specifically on multi-terrain impact simulation, human occupant simulation and injury prediction, probabilistic analysis and uncertainty quantification, and system-integrated helicopter crash test, simulation, and model validation studies. Jackson was instrumental in starting a new, multi-year project between the FAA and NASA to advance crash certification by analysis and demonstration, which will benefit many types of vehicles for the certification process.

Jackson has authored or co-authored over 40 peer-reviewed publications, as well as 114 conference papers, many of which were selected for Best Paper awards. Jackson was recognized as an AHS International Technical Fellow in 2010, "granted to Society members whose technical accomplishments significantly advance the interests of the vertical flight community." Jackson has served on the Board of Directors of AHS International, and continues to be active in the AHS Hampton Roads Chapter, having served in nearly every office; she continues to lead pre-college outreach events in the Hampton Roads area, such as serving as a judge for the Tidewater Regional Science Fair.

Dr. Jackson's Nikolsky Honorary Lecture will be delivered on Tuesday, May 9, 2017 at the Ft. Worth Convention Center in Ft. Worth, Texas. She will be honored at the Forum 73 Annual Grand Awards Banquet with the presentation of the Alexander A. Nikolsky medallion and certificate on Wednesday, May 10, 2017. A detailed written treatise expanding her lecture will be featured in the *Journal of the American Helicopter Society*, the world's only scientific journal dedicated to vertical flight. Information on Prof. Alexander A. Nikolsky and prior Nikolsky Lectures are available at [www.vtol.org/nikolsky](http://www.vtol.org/nikolsky).

The American Helicopter Society (AHS) International is the global technical society for engineers, scientists, and others working on vertical flight technology. AHS brings together industry, academia and governments to tackle the toughest challenges in vertical flight. Since 1943, AHS has led technology, safety, advocacy, and other important initiatives, and has been the primary forum for interchange of information on vertical flight technology.

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