SPE® ANNOUNCES WINNERS OF FOURTH-ANNUAL ACCE GRADUATE SCHOLARSHIPS ON AUTOMOTIVE COMPOSITES

Two graduate students will each receive a $2,000 USD scholarship check from the Society of Plastics Engineers – Automotive & Composites Divisions at this year's SPE Automotive Composites Conference & Exhibition (SPE ACCE), September 15 & 16, 2010 to help underwrite research in composites for ground transportation. **Benjamin Hangs**, a doctoral candidate at the **Fraunhofer Institute of Chemical Technology** (ICT, Pfinztal, Germany) and **Francesco Deleo**, a doctoral student at the **University of Washington** (Seattle, Wa.), were selected from the pool of qualified applicants by the SPE ACCE planning committee and will report the results of their research during next year's eleventh annual SPE ACCE, which takes place September 13-15, 2011. Hangs' work focuses on use of a novel tape-laying machine for rapid, automated, and cost-effective production of tailored layups of unidirectional, thermoplastic tape that are combined with compression or injection molding and other thermoplastic processing methods. Deleo's scholarship project deals with developing numerical guidelines for explicit finite-element analysis (FEA) of composite structures undergoing crash events to improve material models used in the codes. He will also work on developing better material models for fabric-reinforced composites.

Benjamin Hangs graduated with honors earlier this year, earning a degree in Mechanical Engineering from the Karlsruhe Institute of Technology (KIT, Karlsruhe, Germany). During his studies at KIT, he attended several lectures on plastics technology, which led to an interest in plastics in general and composites in particular. That curiosity was further strengthened when, in the spring of 2009, Hangs began working as a student assistant to Dr. Frank Henning's Polymer Engineering department at nearby Fraunhofer ICT. (Henning also teaches at KIT.) Fraunhofer ICT has an active partnership with Fiberforge Corp. (Glenwood Springs, Colo.), and as part of Hangs' work at Fraunhofer ICT and research on his diploma thesis project, he did an 8-month internship with Fiberforge in the U.S., which introduced him to thermoplastic composites and the tape-laying technology. While at Fiberforge, Hangs investigated the effects of fiber angle and resin on the energy-absorption characteristics of continuous-fiber-reinforced tubes made from thermoplastic prepreg tape. Together with Oak Ridge National Laboratory (Knoxville, Tenn.), Hangs subsequently did high-speed crush testing of these tubes within the framework of the HTML User Program. Results of this research work will be published in a journal this fall and Hangs will also present the work at this year's SPE ACCE conference. After graduation in May, Hangs started work as a doctoral candidate at Fraunhofer ICT, where he is continuing with the work he began last year at Fiberforge. Starting with Fiberforge's novel high-speed tape-laying technology, Hangs' scholarship project will investigate methods of integrating functions such as ribs, clips or screw bosses into thermoplastic, continuous-fiber-reinforced laminate structures. This will be achieved by combining them with traditional and novel compression and injection molding technologies. He will also investigate the application of force on a molded part's laminate structure to determine how to maximize the effects of fiber reinforcement to achieve better mechanical properties in thermoplastic composites.

Originally from Italy, Francesco Deleo is a doctoral student in the Department of Aeronautics & Astronautics at the University of Washington in Seattle, where he has previously earned B.S. and M.S. degrees in Aerospace Engineering. In the fall of 2005, Deleo joined the Automobili Lamborghini Advanced Composite Structures Laboratory (ACSL) at the university, where he worked to characterize new materials for automotive crash structures. In a period of a few months, he quickly became familiar with the lab's experimental work concerning composite materials, and his work evolved into a project cosponsored by Lamborghini and The Boeing Co. (Seattle, Wa.) to understand crash behavior of carbon fiber composites – work that has led to six journal publications and several presentations at leading industry conferences. Deleo has became the focal point for testing and analysis of composites undergoing crush loads at the lab and currently is the lead analyst at the ACSL, where he supervises all dynamic simulations, including crash and ballistic analysis and acts as the liaison for joint work between the lab and Lamborghini. Directed by Dr. Paolo Feraboli, former employee of Lamborghini and now assistant professor at the university's Aeronautics & Astronautics department, the ACSL lab was endowed in 2007 as a joint effort between the university, Lamborghini, Boeing, and the Federal Aviation Administration (FAA). Other sponsors include the Air Force Office of Scientific Research (AFOSR) and Office of Naval Research (ONR). The lab specializes in composites research with regard to damage initiation and propagation leading to catastrophic failure, and in particular to damage resistance and tolerance due to bird, hail, and lightning strike, as well as crashworthiness.