Distinguished Professor Reza Abbaschian received a grant from the NASA Engineering and Safety Center (NESC) to investigate the effects of the molten metallic droplets when coming into contact with NASA space suits (Extravehicular Mobility Units/EMU). These experiments are aimed at simulating molten particle generation and contact with an astronaut during Extravehicular Activity (EVA) on the International Space Station. Professor Abbaschian and current graduate students Nicholas Derimow and Steven Herrera recently hosted NESC Chief Engineer T. Scott West from NASA Johnson Space Center to kick-off the experimentation at UCR. Also pictured is Linda Hewes of ILC Dover, the manufacturer of the space suit.

The experimental setup consists of an electromagnetic levitation apparatus paired with a uniquely designed vacuum chamber where the molten metal levitation can occur, and subsequently be dropped onto space suit material at desired temperatures. The suit consists of up to nine layers, each designed to perform a specific function such as protecting against micrometeorites, pressurization, and thermal control. Through the use of specialized vacuum viewports, infrared data can be acquired from the backside of the suit material (astronaut side) after coming into contact with the molten metal on the surface. This data will be used by NASA to ensure the safety of the astronaut during a spacewalk on the International Space Station if molten metal particles were to be generated during maintenance.
Professor Lorenzo Mangolini
NSF iCorps Program Jumpstarts SiLi-Ion Inc. Startup

Professor Mangolini and his postdoc Giorgio Nava have founded SiLi-Ion Inc., a start-up developing advanced materials for the battery market. A team composed of Giorgio Nava, two Ph.D. students from the Mangolini group (Joseph Schwan and Kamran Shojaei) and entrepreneurial mentor Art Salyer has successfully completed the NSF iCorps program. This intense program helps to transition technology from the academic lab to industry by training its participants in market research and customer discovery. Through this program, SiLi-Ion has gained visibility and established contact with the major players in the battery business. In addition, Professor Mangolini and his team have recently received the CalSeed (California Sustainable Energy Entrepreneur Development Initiative) award. This program, supported by the California Clean Energy Fund, aims at developing early-stage clean energy concepts and at facilitating their entrance into the market.
Professor Richard Wilson was honored by the Army Research Office with a Young Investigator Program award for his proposal “Enabling Gigantic Antiferromagnetic Spin Caloritronic Effects”. “The award is to study spin caloritronic effects in multilayered materials. We are looking for materials whose magnetism can be controlled with heat-current” explains Wilson. “By combining magnetic and non-magnetic materials into complex multilayered structures, we plan to control coupling between magnetism and heat. The ability to thermally control magnetism has applications for energy harvesting, next-generation magnetic memories, and THz imaging technologies.” The Young Investigator Program awards are one of the most prestigious honors bestowed by the Army to outstanding scientists beginning their independent careers. The objective of the YIP is to attract outstanding young university faculty to pursue fundamental research in areas relevant to the Army, to support their research in these areas, and to encourage their teaching and research careers. Wilson earned his bachelor's degrees in Applied Physics and Mechanical Engineering from Utah State University in 2009. He received his doctorate in Materials Science and Engineering in 2015, and started as a Mechanical Engineering assistant professor at UCR in 2016.
Highlander Racing, the Formula Society of Automotive Engineers (FSAE) team at UCR, is a student org and racing team comprised of engineering, computer science, business, and film majors.

Here at Highlander Racing, we are very excited to announce that we are in the final stages of completion of UCR’s and Highlander racing’s first ever electric race vehicle. The Vehicle will be revealed to the public Saturday, November 17th at BCOE. This Vehicle is among the most advanced in its class, featuring four in-hub mounted motors putting a total of 120 horsepower to the ground by way of custom manufactured planetary gear reductions. The vehicle also features a custom battery pack made unique by its configuration and one of a kind liquid cooled sub packs that output a combined 100 volts and a continuous peak current of over 800 amps.

In addition to the monumental completion of our first electric race vehicle, Highlander Racing also recently competed in the FSAE Lincoln international design competition with our second ever internal combustion race vehicle. Of a field of 80 collegiate teams from all over the nation, as well as internationally, many of which have had over 20 years of experience, Highlander Racing placed just 49th. Not only did we place well in overall scoring, but for the first time Highlander Racing was able to compete in 75% of the required dynamic events, 100% of static events, passed through a very strenuous tech inspection without a hitch, and placed 21st in the cost report presentation. However, such success did not come without obstacles. Our team encountered an engine failure on day 3 of the event, leading to an unfortunate, but very successful engine swap.

Highlander Racing is very excited to continue pushing the boundaries of our race vehicle development and we are looking forward to competing among the best engineering has to offer with our electric vehicle this June in Lincoln Nebraska.