

IEEE Energy Conversion Congress and Exposition 2017 Emphasizes Energy Conversion for Aviation

The ninth annual IEEE Energy Conversion Congress and Exposition (ECCE) 2017 began on 1 October and came to an end on 5 October, after an exciting and productive five days of nonstop activities, invigorating discussions, and a prolific exchange of ideas between 1,565 attending energy-conversion professionals and researchers. This edition of the conference certainly lived up to its reputation as the premier conference for energy-conversion professionals. Cosponsored by the IEEE Power Electronics Society (PELS) and the IEEE Industry Applications Society, and with support from industry partners Wolong Electric, GE Aviation Systems, and General Motors, ECCE continues to expand its programs to include all areas of energy conversion.

ECCE 2017, which took place in Cincinnati, Ohio, emphasized the theme of energy conversion for aviation.

The conference opened with a welcome address from Joe Krisciunas, the president of GE Aviation Electrical Power Systems.

The aviation theme also attracted three respected and knowledgeable speakers for the plenary session:

- Dr. Hao Huang, technology chief of GE Aviation—Electrical Power, who

gave the talk, “Future Electrification: Beyond More Electric Aircraft”

- Robert Bayles, senior fellow—Electric, Environmental and Engine Systems, UTC Aerospace Systems, who presented “Integration of More Electric Airplanes”
- Dr. Nateri K. Madavan, associate manager for the Advanced Air Transport Technology Project, NASA, who spoke about “The Electrifying Future of Air Transportation.”

The speakers presented a seamless vision of the future of aviation and challenged attendees with the mission of creating our aviation future today. As expected, the plenary session gave focus and excitement to the proceedings as the attendees moved into the technical programs.

A new component to this year’s program was the incorporation of previously existing programs under the professional program. Running alongside the technical program’s oral

sessions and poster presentations, the professional program addressed the needs of practicing engineers. It included a diverse and practical program consisting of tutorials, plenary sessions, special sessions, product and services sessions, and industry exhibitions that spanned a day and a half. The intent of unifying these programs is to give practicing engineers technical content that will help them do their jobs.

A full slate of 11 tutorials opened the preconvention program on Sunday. Tutorials ran the gamut of topics that illuminated the broad range of energy-conversion subjects that define the ECCE conference, including:

- silicon carbide devices
- electric-machine design
- converter designs of numerous types
- wireless energy transfer
- shipboard power-system design and analysis
- dc power system protection.

Ten special sessions were presented, with four addressing the state-of-the-art technology in aviation: electrical power in aviation, the Internet of Things and digital twin for aviation, advanced aircraft electrification beyond the more electric aircraft, and wide bandgap devices for aviation applications. Two sessions fell under the topic power electronics meets power utilities and systems. One session, sponsored by U.S. Power Electronics Industry Collaborative, addressed the future of the power-electronics profession. There was also a session on power electronics and control of low-inertia systems, a special session on the magnetic testing standards, as well as a special session presenting the industry activities in South Korea, cosponsored by the Korean Institute of Power Electronics.

The exhibition portion of the conference was a great success as well, drawing 50 exhibitors with 37 presented poster sessions. Fifteen student demonstration projects were also presented. There was an impressive amount of activity on

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the show floor during the exhibition, with great interaction and exchange of information.

ECCE 2017's technical program drew 1,500 digests and resulted in papers being presented in 141 oral sessions and 37 poster sessions. Some highlights were:

- six modular multilevel converter-related sessions covering topology, pulse width modulation, control and application aspects of multilevel converters
- nine microgrid-related sessions covering microgrid structure, microgrid converters, control, power management, and power quality
- 14 sessions on new device technologies
- seven sessions on wireless power transfer and charging
- six photovoltaic (PV) and solar-related sessions covering PV plants, PV inverter topologies, control, and applications
- three wind sessions.

There were, of course, plenty of opportunities to socialize. The opening reception, the industry night out session, and the awards banquet were very well attended, and the participants had a chance to unwind and gather with friends, new and old.

New programs for women in engineering were offered at this year's conference. The IEEE Women in Power Electronics Society sponsored a very well-attended breakfast for women attending the conference. The ECCE also sponsored a women's event that allowed attendees to socialize and network. To offset the cost of attending the conference, ECCE provided a small travel grant for women professionals who presented papers; ECCE also set aside a family room for all attendees to use as needed. ECCE sees this evolution

as an important part of our conference purpose and mission, and we are planning an even more integrated program for ECCE 2018, so stay tuned.

Young professionals also had a variety of activities at ECCE. They met at a social gathering where they networked and celebrated IEEE Day (3 October). Thirty

of the students received travel grants to attend ECCE.

Another first for ECCE this year was the colocation of the Industry Applications Society Annual Meeting, held just across the street from the convention center. This colocation offered attendees the possibility to engage in two programs promoting the growing energy-conversion field. This colocation will continue at ECCE 2018 in Portland, Oregon.

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