

First ESAS Award for Excellence in Applied Superconductivity

Laudation by Herbert C. Freyhardt at the 12th European Conference on Applied Superconductivity at Lyon on Monday September 06, 2015

Let me introduce myself: Herbert Freyhardt, now retired from the University of Göttingen, and part time with the Texas Center for Superconductivity at the University of Houston.

It's my honor and pleasure to present the first ESAS Award for Excellence in Applied Superconductivity. This happens at the beginning of the 12th EUCAS, the European Conference on Applied Superconductivity, which I had the privilege to found in October 1993 at the University of Göttingen, my alma mater. Now, we convene in the beautiful Lyon, very near to Grenoble the home of our chairman Pascal Tixador ... who was most eager to set up an utmost attractive conference.

The ESAS Award for Excellence in Applied Superconductivity is presented to a colleague from our international community to "recognize excellence in advancing the knowledge of applied superconductivity over the past five years".

The ESAS Awards Committee had to find the winner by evaluating and recognizing the candidate's significant contributions to the field of applied superconductivity by assessing:

- the quality of the candidate's research performed over the past five years,
- the international recognition gained for the candidate's work over the past five years,
- and the candidate's impact on the field over the past five years.

The Award Committee received five nominations and one self-nomination. To find the winner, the best awardee, was not easy and turned out to be the result of a very tight vote ... all was very close. The members of the Award Committee, two from each field of *Electronics, Materials* and *Large-Scale*, all tried to avoid personal preferences. We all tried to do the best to remain as unbiased as possible. The 1st choice was communicated to the ESAS Board, from which unanimous approval was obtained. The winner of this inaugural ESAS Award for Excellence in Applied Superconductivity is:

Dr. Wilfried Goldacker from
the **Institute of Technical Physics**
of the **Karlsruhe Institute of Technology**.



The certificate reads: *In recognition of his outstanding contributions in developing advanced Roebel-Coated-Conductor technologies. He accumulated a substantial body of understanding and insight aimed at establishing their capability for providing cables, the Roebel-Coated-Conductor Cables, of a most complex superconductor, which will have a sustainable impact for magnet technology, electrical and power engineering. Wilfried Goldacker gained internationally broad recognition for his thoughtful and thorough thinking that not only addresses the key problems of the technology but also provided the basis for his broad dissemination of this knowledge.*

Wilfried Goldacker studied, from 1971 to 1976, physics at the University of Heidelberg, where he earned in 1976 his PhD with a thesis at the *Max Planck Insitutut für Medizinische Forschung* at Heidelberg, and where he stayed as a postdoc until 1981. After this education and learning period, Wilfried switched to the Research Center Karlsruhe, where he became Head of the Superconducting Materials Group at the Institute for Technical Physics, and since 2006 Head of the department “Superconducting Materials and Applications in Energy Technology” of the now renamed Karlsruhe Institute of Technology.

This award honors Wilfried’s tireless effort of the development and verification of cabling concepts for HTS tapes. He reinterpreted Roebel’s concept of subdividing a conductor bar into several conductor strands, which are stacked and transposed, thus reducing the losses ... in AC applications ... and ,thereby, increasing the efficiency of large electric devices. Lead by this idea, Wilfried developed the Roebel Assembled Coated Conductor, the so called RACC cables. The goal was to contribute to the design and manufacturing of large-current, filamentized HTS cables for applications in magnet technology, electrical and power engineering. Both, his R & D and his leadership covered a wide span of activities, from basic materials research, processing and manufacturing of cable strands and the final cables, sophisticated testing of their normal and superconducting as well as electro-mechanical properties, and all of this combined with elaborate modeling of cables and assembled conductor packages, which are e.g. used in coil assemblies. To name and highlight only a few, these efforts comprised not only the systematic development of methods for structuring ... striating ... the respective coated conductor tapes with a picoseconds YAG laser, the detailed endeavor and optimization of critical current properties, hysteretic losses or strand-to-strand coupling and current sharing, but was also extended to investigations of the mechanical and electro-mechanical robustness ... which can play an essential role for applications. Applications ... with this respect Wilfried and his team, very goal oriented, developed within the European project EUcard2, RACC cables for insert coils for LHC dipoles in back-ground fields up to 20 T, for the upgrade of CERN’s Large Hadron Collider. Moreover, for possible use in fusion magnet technology, a revised concept of a Rutherford cable with HTS Roebel strands was developed.

Wilfried Goldacker gained internationally broad recognition for his thoughtful and thorough thinking that not only addresses the key problems of the technology but also provided the basis for his broad dissemination of this knowledge in many papers and numerous invited or plenary talks.

On behalf of the ESAS Board it’s now my great pleasure to present this **Inaugural ESAS Award for Excellence in Applied Superconductivity to Wilfried Goldacker.**