Mircea Popescu (M'98, SM'04**)** received the MEng and PhD in electrical engineering from University "Politehnica" Bucharest, Romania in 1984 and 1999 respectively and the Doctor of Science degree from Helsinki University of Technology, Finland respectively in 2004. He has almost 30 years of experience in electrical motor design and analysis. He worked for Research Institute for Electrical Machines, Bucharest, Romania, as Research Engineer and Project Manager, Helsinki University of Technology, Finland as Research Scientist and University of Glasgow, U.K as Research Fellow.
Since 2008, Dr. Popescu is the Engineering Manager and Chief Design Officer of Motor Design Ltd., U.K, leading R&D projects on electrical machines and drives for power traction applications, including hybrid/electrical vehicles, and formula-e racing cars, for wind power generators, for a series of line-start permanent magnet integrated drum motors for conveyer belts and hermetic compressors and, for a series of induction motors for deep submersible pumps. The R&D projects resulted in new products for speed ratings between 20rpm to 150,000rpm, and power ratings from 60W to 1MW. Dr. Popescu work is widely used in industrial and commercial equipment incorporating pumps and compressors.

Dr Popescu published over 100 papers in conferences and peer reviewed journals. He is the recipient of the first prize, best paper award from IEEE IAS EMC in 2002, 2006, 2008. He acted as Technical Vice-Chair for IEEE ECCE (Energy Conversion Congress and Exhibition) event from 2010 to 2013.

Dr. Popescu is the Chair of IEEE IAS Electrical Machines Committee and Senior Member of IEEE Industry Applications, Industrial Electronics and Magnetics Societies.
Other achievements of Dr. Popescu are:

- Member of the organizing committee for the international conference on power electronics, electric machines and drives organized by IET, PEMD 2014, Manchester, U.K.
- Track and session chair for many conferences in the ICEM bi-annual series
- Member of the UK Magnetics Society since 2004
- Lecturer for MAGEF project - Permanent Magnet Machine Technology for Boosting the Energy Efficiency in Traction and Marine Applications – Workshop 1, 16-18 October 2014, Zagreb, Croatia
- Invited speaker at SAE 2102 Electric Powertrain Technologies Symposium, Stuttgart, Germany, October 2012 and Magnetic Materials in Electrical Machines Conference, Pori, Finland, 2009.
- Invited speaker at UK Magnetic Society events, such as Making rare earth magnets rarer, 23 November 2011, Derby, UK
- Visiting Assistant Professor in the Electrical Engineering Department, University "Politehnica" Bucharest, Romania between 1990 – 1997
- Paper reviewer for journals: IEEE Transactions on Ind. Appl., Magnetics, Energy Conversion, Ind. Electronics and IET Electric Power Applications
- Tutorial instructor at PEMD 2010, Brighton, UK and IEMDC 2013, Chicago, USA
- Lecturer on design and optimization of electrical machines; short classes held in: USA, Canada, UK, Germany, France, Thailand, China

Dr. Popescu contact information:

Engineering Manager
Motor Design Ltd.
4 Scotland Street
Ellesmere SY12 0EG
Shropshire, U.K.
E: mirceap@ieee.org
T: + 44(0) 1691 623305
W: http://www.motor-design.com

Lecture topic

Practical Aspects in the Design and Analysis of Electric Machinery for Power Traction Applications

The lecture covers from an industrial perspective some of the latest developments in the subject area and includes timely topics such as heating and ventilation, the torque ripple due to eccentricity, manufacturing technologies like segmented stators for brushless PM machines and die-cast copper rotors for induction motors, the role of computer aided engineering in the industrial environment.

The state of the art topologies and the emerging trends are also presented. Particular emphasis is placed on the possible shortage of NdFeB magnets and on potential alternatives for rare-earth free or magnet free solutions.

Various cooling systems for electric machines are illustrated in detail, with a focus on forced convection – air or liquid - methods. A high torque density value is achievable only if an efficient cooling is employed. The merits and problems for the existing cooling system are discussed. Topics such as the risk for PM demagnetization, the effect of switching frequency, supplementary AC losses and magnet losses are discussed.

A comparison between the permanent magnet motor solutions – interior and surface rotor mounted motors - with magnetless solutions – induction motors and reluctance motors is presented. A discussion of the trends and anticipated industry developments is also included.