Title: "Fundamentals of Cognitive Green Small Cell Networks" by M. Debbah, Alcatel-Lucent Chair Supelec France

Abstract: The general term "small cell networks" covers a range of radio network design concepts which are all based on the idea of deploying base stations much smaller than typical macro cell devices in order to offer public or open access to mobile terminals. The main benefits are: – to allow offloading the traffic from the macro cell and provide dedicated capacity to urban hotspots – to allow for unprecedented mobile system capacities (in terms of Gbit/s/km2) – to have the potential to reduce the ecological footprint of cellular networks by bring mobiles and base stations closer together – To make cell site rental and dedicated backhaul provisioning superfluous since they rely on existing backhaul infrastructure – Finally, self-organization and optimization of the devices allows for plug and play deployment, requires no network planning and reduces maintenance costs. We will discuss the challenges ahead and some research directions that develop the theoretical and practical foundations of these networks.

Bio:
Mérouane Debbah was born in Madrid, Spain. He entered the Ecole Normale Supérieure de Cachan (France) in 1996 where he received his M.Sc and Ph.D. degrees respectively in 1999 and 2002. From 1999 to 2002, he worked for Motorola Labs on Wireless Local Area Networks and prospective fourth generation systems. From 2002 until 2003, he was appointed Senior Researcher at the Vienna Research Center for Telecommunications (FTW) (Vienna, Austria) working on MIMO wireless channel modeling issues. From 2003 until 2007, he joined the Mobile Communications department of the Institut Eurecom (Sophia Antipolis, France) as an Assistant Professor. He is presently a Professor at Supelec (Gif-sur-Yvette, France), holder of the Alcatel-Lucent Chair on Flexible Radio. His research interests are in information theory, signal processing and wireless communications. He is an Associate Editor for IEEE Transactions on Signal Processing. Mérouane Debbah is the recipient of the "Mario Boella" prize award in 2005, the 2007 General Symposium IEEE GLOBECOM best paper award, the Wi-Opt 2009 best paper award, the 2010 Newcom++ best paper award as well as the Valuetools 2007,Valuetools 2008 and CrownCom2009 best student paper awards. He is a WWRF fellow.