

## **Workshop WG3: Quantum spin science and technologies**

'Be Live Experience Playa la Arena' in Puerto Santiago (Tenerife, Spain)

May the 25<sup>th</sup> 2018

### **Introduction and aim of the workshop:**

Spins in solids or molecular hosts are natural candidates to realize new devices working as quantum sensors, quantum simulators or universal quantum processors. For this, achieving an exquisite control over the quantum state of individual spins will be required. The workshop aims to bring together specialists on molecular spintronics, spin qubits and quantum circuits, provide a relaxed atmosphere to promote fruitful scientific discussions and help establishing collaborations that contribute to develop future quantum technologies.

### **Invited speakers**

Gabriel Aeppli, PSI, Switzerland

Arzhang Ardavan, U. Oxford, United Kingdom

Fernando González-Zalba, Hitachi-Cambridge, United Kingdom

### **Programme of the workshop. May the 25<sup>th</sup> 2018**

#### **Session 1** (Chair: E. Coronado)

9:00 A. Ardavan (invited)

9:40 A. Ariciu, "S-block radicals as molecular electron spin qubits"

10:00 E. McInnes, "Pulsed EPR measurement of molecule...molecule interactions"

10:25 F. Lombardi, "Spin manipulation in open-shell aromatic hydrocarbons"

10:45 A. Lodi, "Investigation of the magnetic properties of graphene nanoribbons through pulsed electron spin resonance. A potential route towards room temperature quantum operations"

11:05 L. Bogani, "Molecular control of magnetization in graphene: synthetic approaches, devices and coherent control"

11:30 Coffee break

#### **Session 2** (Chair: D. Stepanenko)

12:00 G. Aeppli (invited)

12:40 B. Tsukerblat, "Symmetry assisted approach to treat large multidimensional vibronic systems: theoretical background and some applications"

13:05 S. Olafsson, "Rydberg matter of hydrogen a quantum material? Present status of experiments and theory"

13:30 D. Reta, "Molecular magnetic hysteresis at 60 K in dysprosocenium"

13:55 Lunch

**Session 3** (Chair: F. Luis)

16:00 F. González-Zalba (invited)

16:40 J. Majer: "Coupling spins to superconducting circuits for quantum technologies"

17:05 C. Bonnizzoni: "Coherent coupling of molecular spin ensembles with superconducting YBCO dual-mode microwave resonators"

17:30 D. Zueco: "Suppression of superradiance by magnetic correlations"

17:55 Coffee break

18:30 L. Escalera, "Modeling quantum decoherence in molecular spin qubits"

18:50 R. Hussain: "Yb(Trensai) Single Ion Magnet as a potential Qudit candidate"

19:10 M. Ruben: "Implementation of the Grover quantum search algorithm on TbPc<sub>2</sub> qudits"

19:35 Closing