

The Students Workshop on Magnetism in Spain

The **Students Workshop on Magnetism: From Fundamentals to Applications**, organized by the Magnetism Spanish Club (CEMAG) with the sponsorship of the IEEE Magnetic Society, was successfully held **from June 6th to 10th, 2022, in Llanes, Asturias**, a beautiful place in the North of Spain.

The **Organizing Committee** of the Workshop was composed by: Irene Lucas (General Chair, from Univ. of Zaragoza), Montserrat Rivas (President of CEMAG, from Univ. of Oviedo), Rafael Pérez del Real (Treasurer of CEMAG, from ICMM-CSIC) and José Miguel García-Martín (Chair of the Spain Chapter of IEEE Magnetics, from IMN-CSIC).

Thirty-eight students and young doctors participated in the Workshop, 25% from foreign institutions in Italy, USA, Thailand and Chile, who received more than twenty hours of classes on various aspects of magnetism such as the manufacture of magnetic materials, their fundamental properties, advanced characterization and simulation techniques and their current applications in energy, information technologies and medicine. Thanks to the generous financial support of the IEEE Magnetics Educational Committee, **fifteen** of those attendees **received a scholarship** that covered registration and accommodation, i.e. those that belonged to IEEE.

Country of the Institution	IEEE students	Non-IEEE students
Spain	6	23
Thailand	4	0
Chile	3	0
Italy	1	0
USA	1	0
TOTAL	15	23

The participants complemented their training with seminars on how to write attractive scientific articles and improve their oral communication, and these latter skills were put into practice in afternoon sessions where they gave short talks presenting their theses or ongoing projects and their preliminary results. Moreover, a couple of **round tables** were held, one on *Popular Science* and the other on *Women in Magnetism*. And in the Welcome session, the Chair of the Chapter explained what the **IEEE Magnetics Society** is and the **benefits** of being a member.

There were **twenty-six teachers**, all of them came from Spanish institutions except Ron Goldfarb (Treasurer of IEEE Magnetics), from NIST, USA, who also acted as “official” photographer of the event. Fourteen of those teachers are IEEE members.

It is also worth noting the participation of representatives from the **industrial sector**, in particular from [IMA company](#) (*Ingeniería Magnética Aplicada*), a leader in the manufacture of magnets and electromagnets.

Regarding **gender distribution**, it should be noted that both among the speakers and among the young researchers, **40% were women**. However, unfortunately, of the attendees traveling from other countries, only one was a woman, although there were foreign women in the audience who are doing their PhDs or postdocs in Spain.

We want to emphasize the good atmosphere in all the sessions: the students asked many questions and there were lively discussions during the coffee breaks and lunches. Lastly, we

want to mention that the workshop even had repercussions in the **regional press** (article in [La Nueva España](#)), and a [post in LinkedIn](#) has reached above **2,600 visualizations**.

FINAL SCHEDULE

	MONDAY 6th	TUESDAY 7th	WEDNESDAY 8th	THURSDAY 9th	FRIDAY 10th
9:00-10:00	Welcome Session (Irene Lucas, Montserrat Rivas & José Miguel García- Martín)	Magnetism at the nanoscale II (Arantxa Fraile Rodríguez)	Advanced microscopies: MFM and related techniques (José Miguel García- Martín)		Introduction to advanced spintronics (Luis Hueso)
10:00-11:00	Short introduction to Magnetism (Manuel Vázquez)	Magnetism at high frequency (Adriana Figueroa)	Additive fabrication of permanent magnets (Ester Palmero)	Spin-orbit interaction and Spin Hall Effects (Rafael Ramos)	Molecular Magnetism (Eugenio Coronado)
11:00-11:30	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK
11:30-12:30	Magnetism at the nanoscale I (Víctor de la Prida)	Hard X-ray emission spectroscopy with synchrotron radiation: a powerful bulk-sensitive tool for studying magnetism (Sara Lafuerza)	Magnetic materials for biomedical application (María Luisa Fernández-Gubieda)	LithographyTechniques in magnetic structures (Javier Pablo Navarro)	First Order Reversal Curves (FORC) and its variants for the study of phase transitions (Victorino Franco)
12:30-13:30	Micromagnetic Simulations (Eduardo Martínez)	Magnetic Microwires (Rafael Pérez del Real)	Advanced characterization of magnetic nanoparticles (Lourdes Marcano)	Magnetocaloric materials (Jia Yan Law)	Emerging magnetic sensors and technology transfer (Pilar Marín)
13:30-15:00	LUNCH	LUNCH	LUNCH	LUNCH	CLOSING SESSION & LUNCH
15:00-16:00	Written Communication on Science (Ron Goldfarb)	Conventional Techniques (VSM, SQUID, MOKE) (Lucas Pérez)	In silico testing of translational magnetotherapies (Daniel Ortega)	IEEE Networking Young Students	
16:00-17:00	Developing a professional career (Ingeniería Magnética Aplicada S.L.)	Popular science (Jose A. Fernández, José.M.García-Martín, Arantxa Fraile Rodríguez, Irene Lucas)	Oral communication in science (Montserrat Rivas)	Women in Magnetism (Montserrat Rivas, Pilar Marín, Irene Lucas, Jia Yan Law & students!)	
17:00-17:30	COFFEE BREAK	COFFEE BREAK	COFFEE BREAK		
17:30-18:30	IEEE Networking Young Students	IEEE Networking Young Students	IEEE Networking Young Students		

Representative photos of the event

(captured by Ron Goldfarb)



Picture of all participants in the 1st day of the event.



The Organizing Committee



The venue during Victor M. de la Prida's talk



The speakers from IMA company



During the *Popular science* round table



During the *Women in magnetism* event



A student asking Manuel Vázquez a question



Lively discussion with Rafael Pérez del Real



Teachers and students during a break