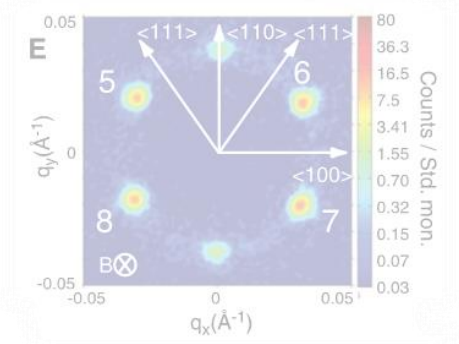
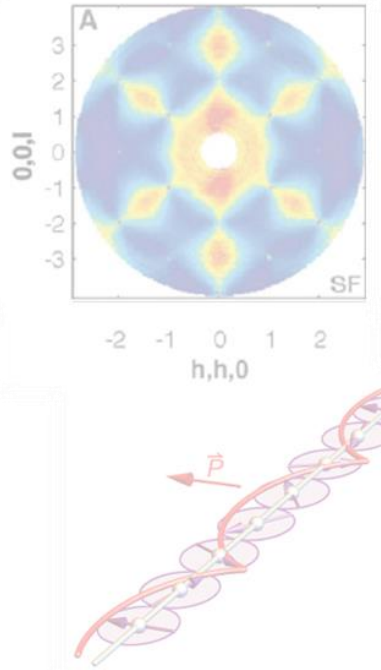
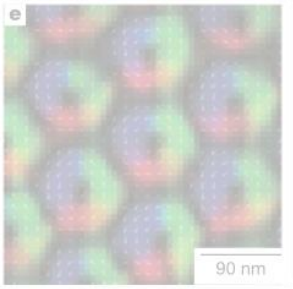
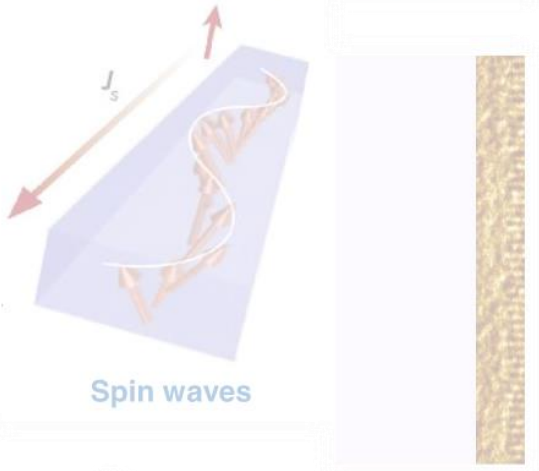
The European School on Magnetism 2017

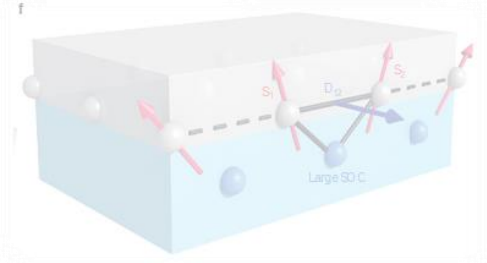
Condensed Matter Magnetism: Bulk meets Nano











PRACTICAL INFORMATION

- *Tap water is perfectly drinkable and healthy*
- *Take a light with you if you walk from IESC to village in the dark*
- *Survival kit of French language in the booklet*
- *Wifi available at IESC. Please use it for learning purposes during the lectures*

HISTORY of the SCHOOL

Start: French-Romanian schools Grenoble / Cluj-Napoca
11th school since 1997

- *Nanomagnetism* (1997) Oradea
- *High performance permanent magnets* (1999) Cluj-Napoca
- *Spectroscopic analysis* (2001) Cluj
- *Magnetism of nanoscopic systems and hybrid structures* (2003) Brasov
- *New experimental approaches in magnetism* (2005) Constanta
- *New Magnetic Materials and their Functions* (2007) Cluj
- *Models in magnetism: from basic aspects to practical uses* (2009) Timisoara
- *Time-dependent phenomena in magnetism* (2011) Târgovişte
- *Magnetism for Energy* (2013) Cargèse
- *From basic concepts to spin currents* (2015) Cluj
- ***Condensed Matter Magnetism: bulk meets nano* (2017) Cargèse**
- *Magnetism by light* (2018) Kraków
- *Experimental techniques* (2019) Brno
- … (2020) Saarbrück

An organization to promote magnetism in Europe

Mission

- Advance knowledge
- Higher education
- Promote applications, link academics and industry
- Representation of the magnetics community (European Physical Society, policy makers etc.)

Actions

- ESM
- Conference: JEMS
- Networking through the web site:
  - News
  - Job market
  - Agenda of events
  - Links (societies, tools, books, companies)

Web site: http://magnetism.eu

The EUROPEAN MAGNETISM ASSOCIATION

A voice for Magnetism in Europe

EMA | ESM | JEMS | ACTIONS | JOBS | AGENDA | LINKS

Home > JEMS

JEMS

The Joint European Magnetic Symposia are the most important and comprehensive conference on magnetism in Europe. JEMS focuses on a broad range of topics embracing applicative and fundamental aspects of magnetism, as well as novel magnetic materials. Presentations consist of plenary, semi-plenary, and contributed talks, complemented by poster sessions. A number of invited speakers give lectures on important recent advances in the field. The attendance of young students is welcome.

Previous JEMS conferences took place in Grenoble (2001), Dresden (2004), San Sebastian (2006), Dublin (2008), Krakow (2010), Parma (2012), Rhodes (2013) and Glasgow (2016). Starting 2012 JEMS is being held every year, except those when Intermag or ICM take place in Europe (e.g. Intermag2014, ICM2015 and Intermag2017). The latest conference:

JEMS Joint European Magnetic Symposia

JEMS2016

The eighth edition of the event was held in **Glasgow, Scotland, UK, 22-26 August 2016.**

The **forthcoming conferences** are:

JEMS2018

To be held in **Mainz, Germany, 3-7 September 2018**.

JEMS2019

To be held in **Uppsala, Sweden, 26-30 August 2019**.

JEMS

- Presentation
- International Advisory Committee
- Editions

JEMS 2018

- where: **Mainz, Germany**
- when: **3-7 September 2018**
- webpage
- Abstract submission open!

NEWS

3D Printing of Polymer

The European School … | The Joint European … | Open positions … | Companies Tools

Web site: http://magnetism.eu/jems

WHAT is ESM ?

Objectives

⇨ Modern education on the foundations of Magnetism

- Basic lectures (50%)
- Specialized lectures (50%)

⇨ Networking

- Student ↔ Student ↔ Lecturer
- Student ↔ Industrial

Key facts

⇨ Large : 85 students

⇨ Long : 11 full days

⇨ Broad scope ; mix communities

⇨ Affordable for all :
low cost; a few grants offered

⇨ Timing: every 2 years (so far),
will change to every year starting 2018

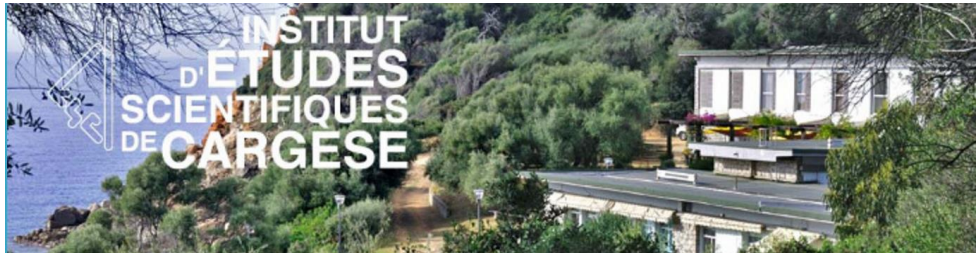
About ESM 2017

Organizing committee:
Olivier Fruchart, Virginie Simonet, Olivier Isnard, Claudine Lacroix, Ingrid Mertig, Muriel Martinez (secretary SFP)

Local student committee: Vadim Cathelin, Elie Ravoavy, Titiksha Srivasta, Beatrix Trapp, Dominika Zákutná

Scientific Advisory Committee: Franca Albertini, Stephen Blundell, Michael Coey, Vincent Cros, Alina Deac, Claudia Felser, Olivier Fruchart, Laura Heyderman, Olivier Isnard, Andrei Kirilyuk, Claudine Lacroix, Christian Pfleiderer, Marek Przybylski, Karl Sandeman, Virginie Simonet, Nicola Spaldin, Josef Spałek, Julie Staunton, Sergio O. Valenzuela, Wulf Wulfhekel, Andrej Zorko

Location



Support





nano SCIENCES
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DE CARGÈSE

Université
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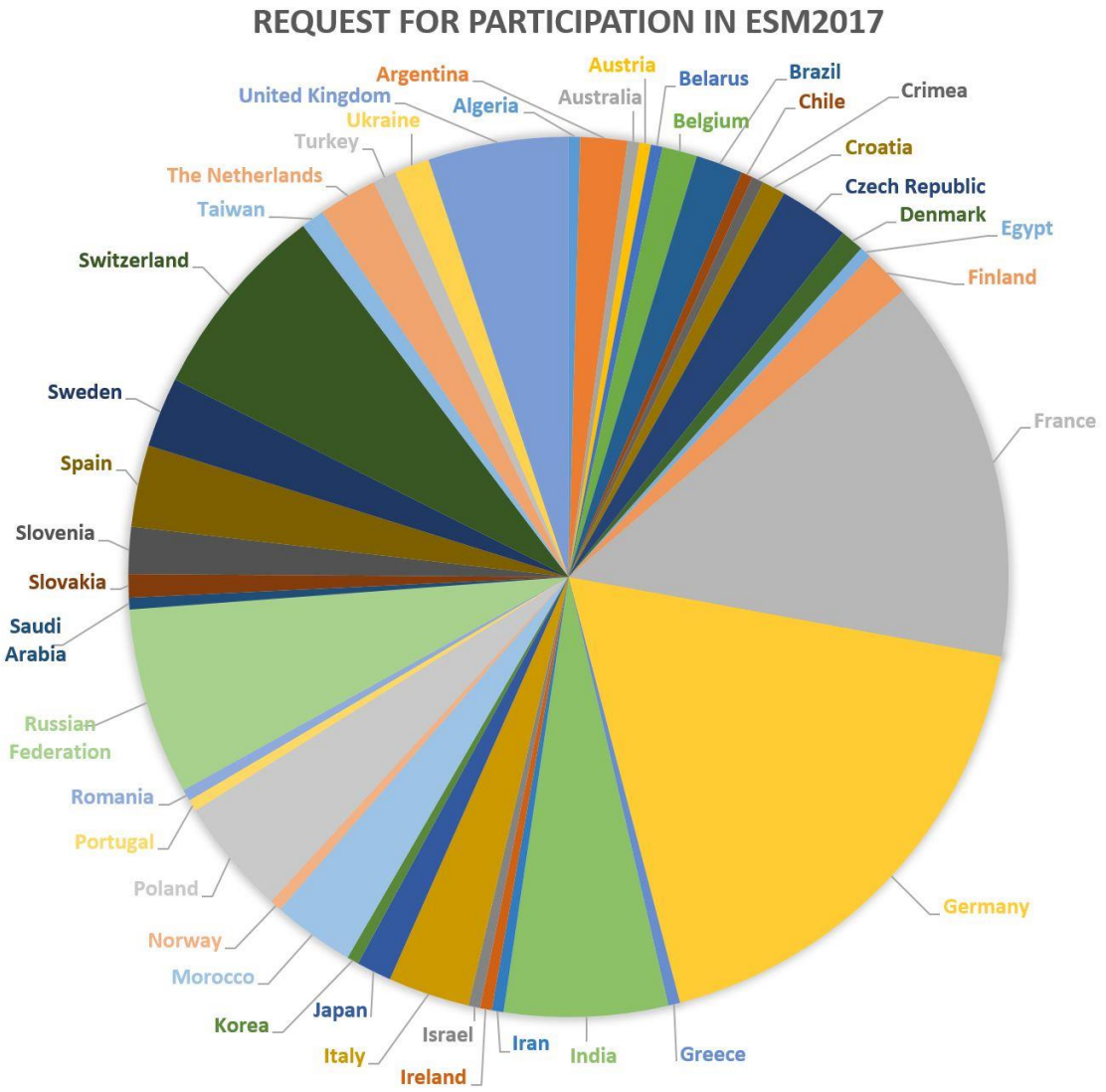
Deutsch-Französische
Hochschule

EPS

WILEY-VCH

YOU !

- ⇨ 235 requests,
  85 participants, 30 % ladies
- ⇨ Labs from 41 countries
- •Mainly Europe
- • 10 % Asia, Middle-East, Americas
- ⇨ Almost 2/3 rejection rate



Motivations for 2017 topics

Two main communities, **Bulk and Nano**, working in the field of magnetism

Different: aims, tools, materials, BUT:
Recent convergence around some topics: spin-orbit coupling, topological matter, magnetic chirality, skyrmions, oxitronics, multiferroics, magnetic, excitations…

- Aim: **Foster cross-fertilization**. Prepare the next generation of researchers in magnetism with a foot in each field!

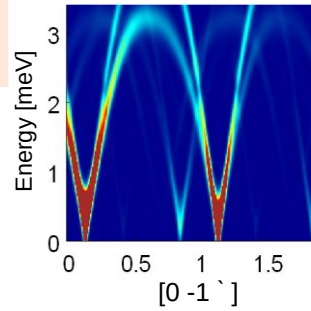
Motivations for 2017 topics: the bulk side

- Find new behaviors at the origin of concepts/models spreadable in other fields
- Microscopic mechanisms and unconventional behaviors of complex materials.

- Extreme conditions
- Several degrees of freedom (lattice, spin, orbit, charge, …)
- Complex bulk materials
- Competing effects

Dedicated tools:
- Macroscopic measurements
- Local probes: NMR, muSR, ESR…
- Spectroscopy (Raman, optics, THz)
- Neutron and X ray diffraction

-> work in reciprocal space



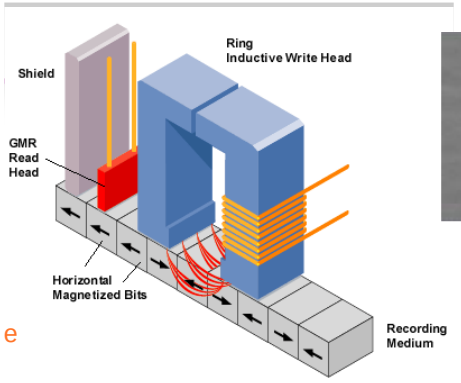
Topics: Multiferroics/magnetoelectrics; Excitations (spinwaves, fractional); Topological magnetism; Spin-orbit coupling; Chirality, skyrmions, spin textures; Magnetic frustration; Quantum magnetism, low dimensionality

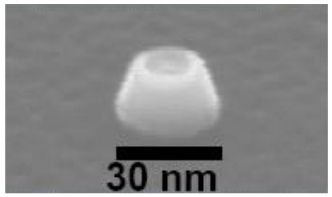
Motivations for 2017 topics: the Nano side

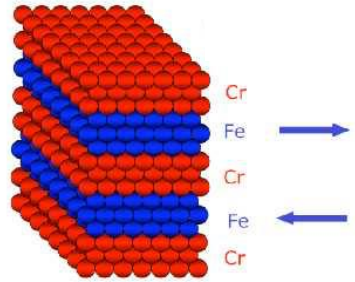
-New functionalities associated with nanoscale and interfaces
-High potential of nanomagnetic systems for present and future technologies

- Aiming at room temperature
- Simple materials, designed at the nanoscale or in heterostructures
- Tools: microscopy, micromagnetic calculations, X-ray dichroism
- Physics + applications

Topics:
Spintronics
High magnetoresistance / Spin transfer
Magnetization dynamics, Magnonics
Novel way to control magnetism
Skyrmionics
Oxytronics, antiferromagnetic spintronics







Giant magnetoresistance
Fert, Grünberg, et al. 1988

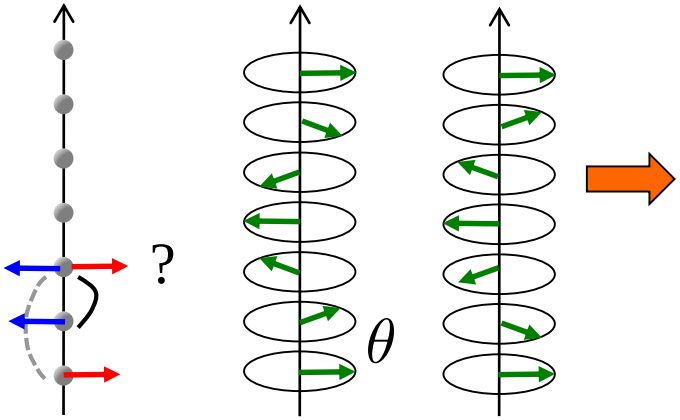
Motivations for 2017 topics. Example: frustration

Magnetic frustration: one or several constrains can not be satisfied simultaneously

Through competing interactions:

Spin chain

AFM J_1
≈AFM J_2

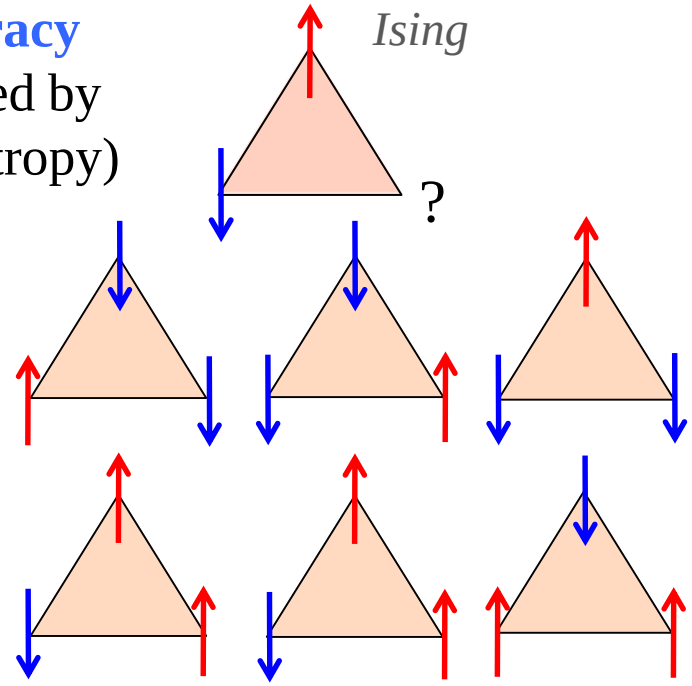


Complex magnetic order

Through the geometry of the lattice:

Degeneracy
(measured by finite entropy)

Ising

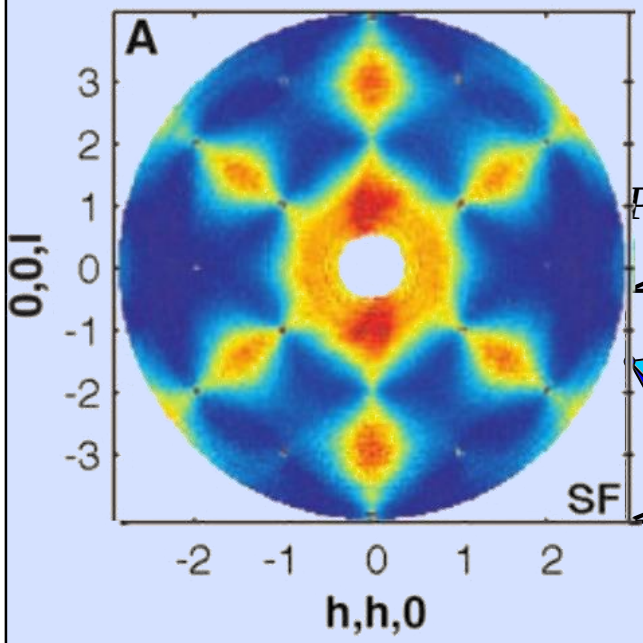


Motivations for 2017 topics. Example: frustration

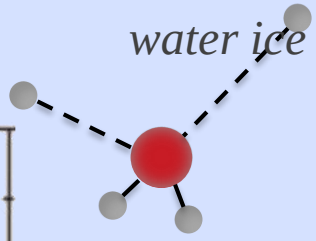
Bulk

Exotic fluctuating states and excitations:
Spin liquids, spin ices (magnetic monopole)
Coulomb phases, …

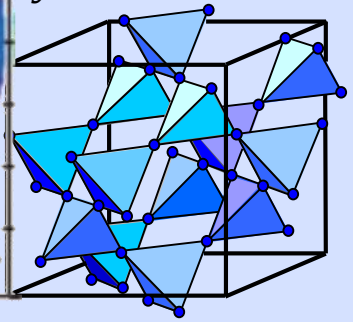
Neutron diffuse scattering



water ice

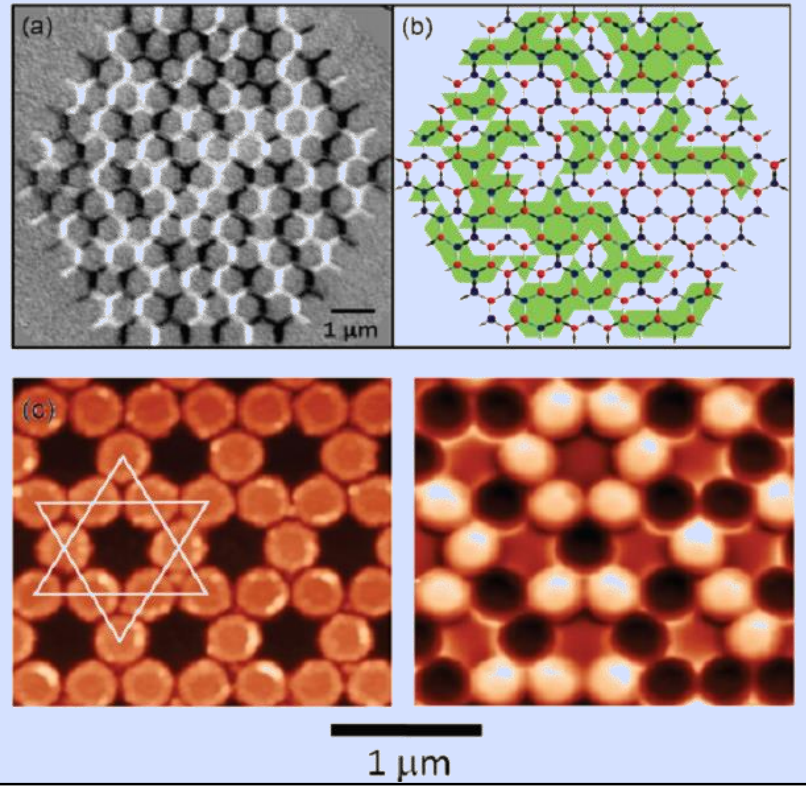


Pyrochlore lattice



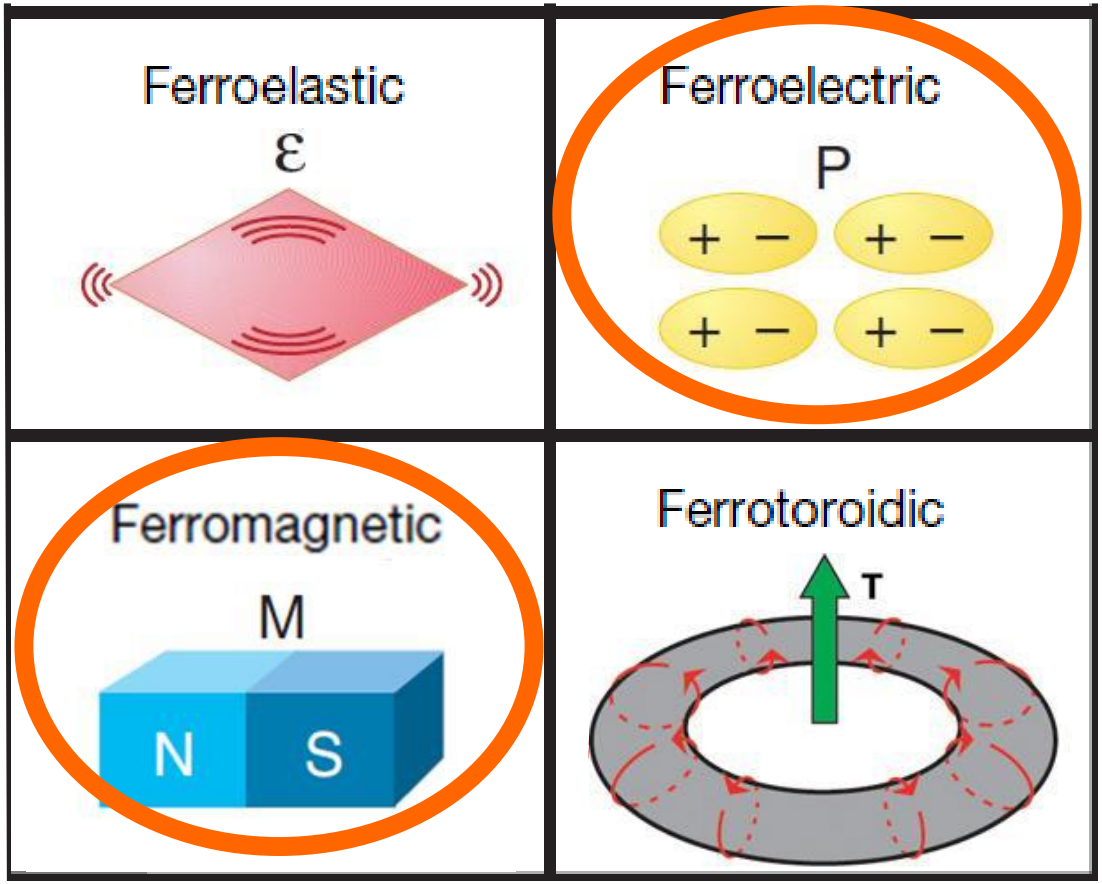
Nano

Artificial spin ice
Nanomagnetic = macrospin)
Designed at will, models can be tested



Motivations for 2017 topics. Example: multiferroism

Coexistence of at least two (anti)ferroic orders among :
ferroelasticity, ferromagnetism, ferroelectricity, and ferrotoroidicity



+ Hysteresis cycle,
presence of switchable domains

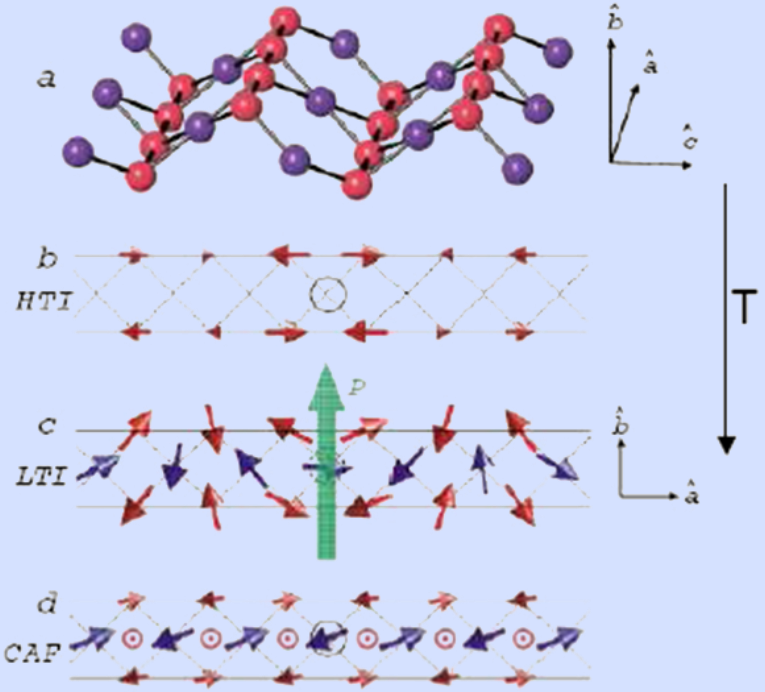
Possible coupling
between order parameters

Van Aken et al. Nature 449 (2007)

Motivations for 2017 topics. Example: multiferroism

Bulk

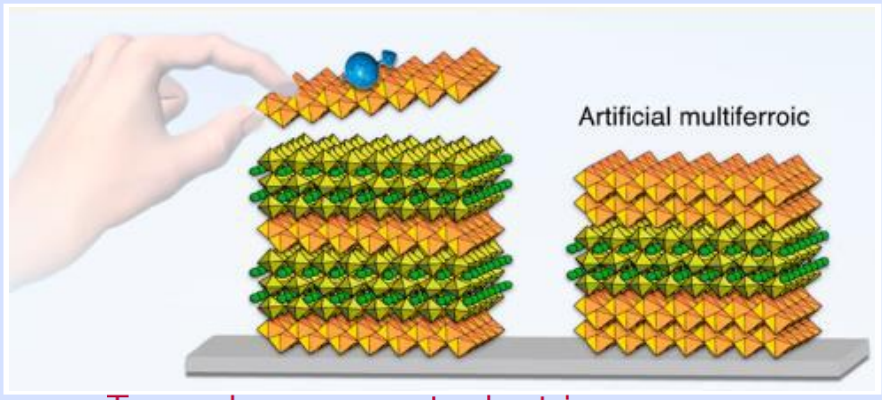
Complex (H,T) phase diagram
Complex magnetic structures (ex. cycloids)
Ferroelectricity can be induced by magnetism
Strong Magnetoelectric coupling



$Ni_3V_2O_8$ Lawes PRL 2005

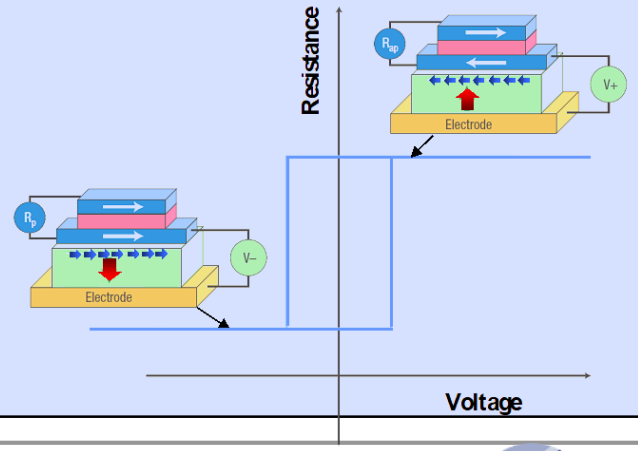
Nano

Use interfaces instead of compounds



Towards a magnetoelectric memory

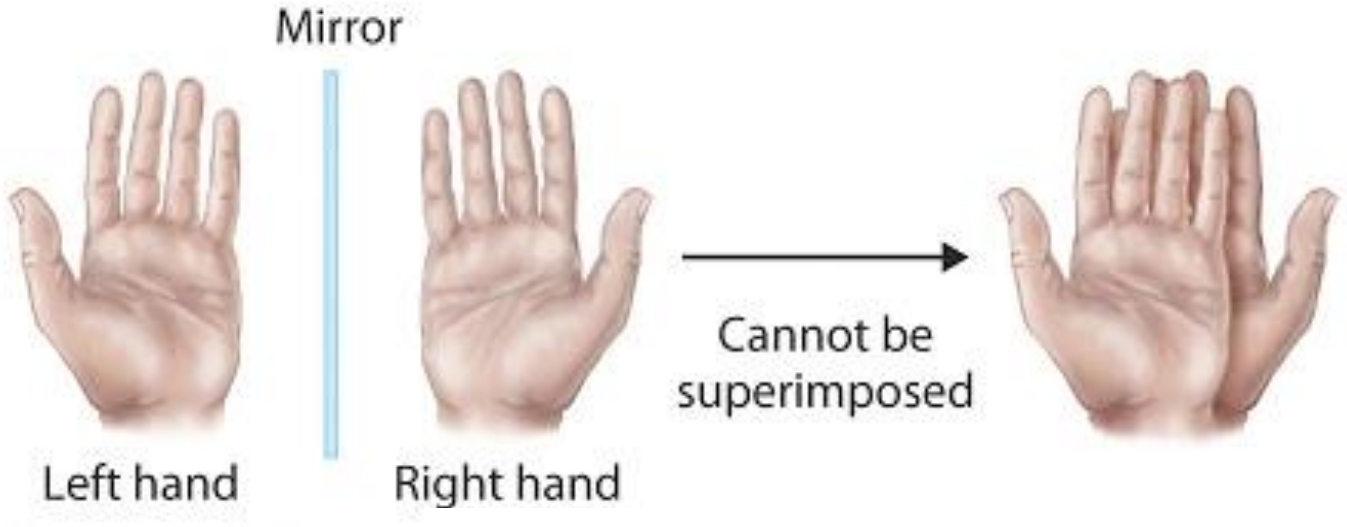
M. Bibes et al., Nature Materials 7 (6), 425 (2008)

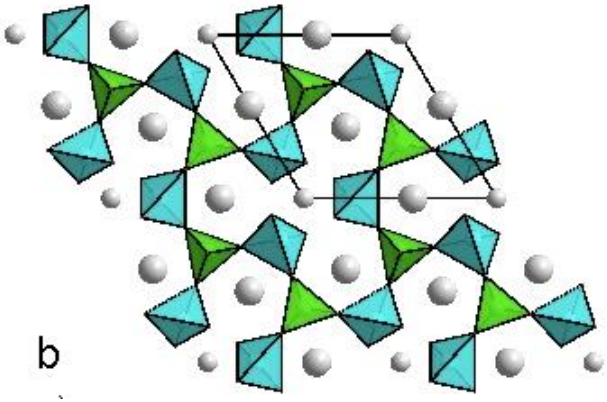


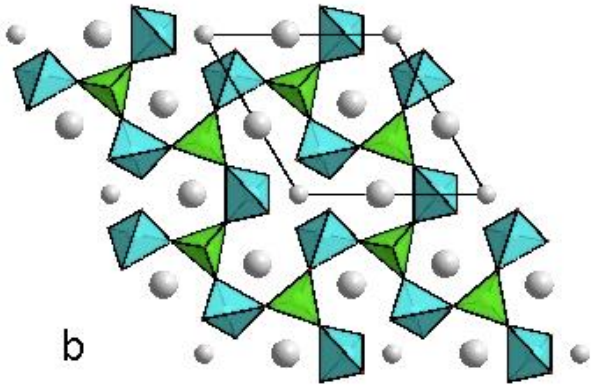
Motivations for 2017 topics. Example: chirality

Distinguishes a phenomenon from its counterpart in a mirror (or inversion center)

Χειρ
Hand in Greek

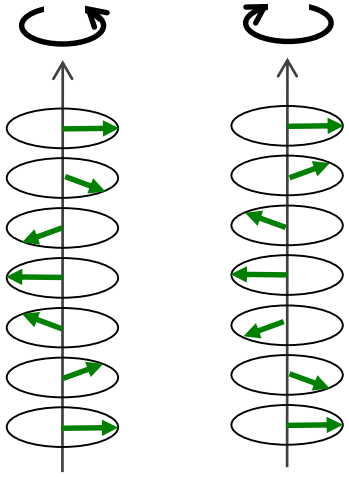




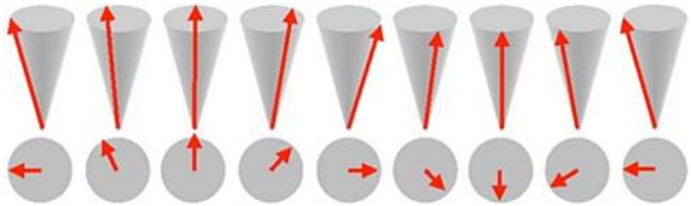


Motivations for 2017 topics. Example: chirality

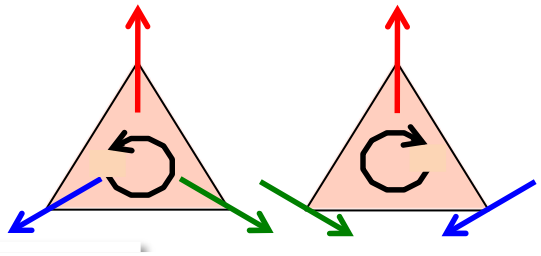
Extended definition of chirality in Magnetism ➔Sense of rotation of non collinear spins along an orientated line



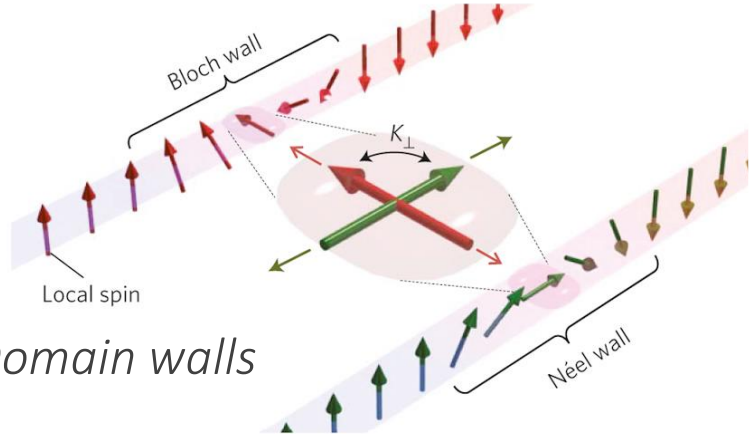
Magnetic helix



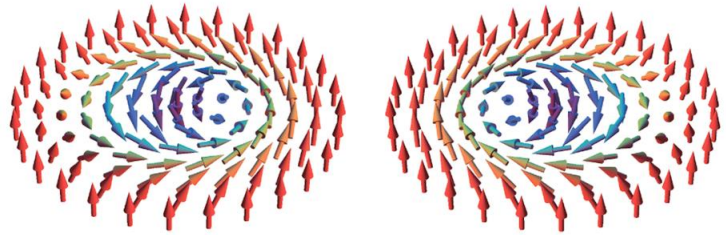
Spinwaves



Triangular chirality



Domain walls

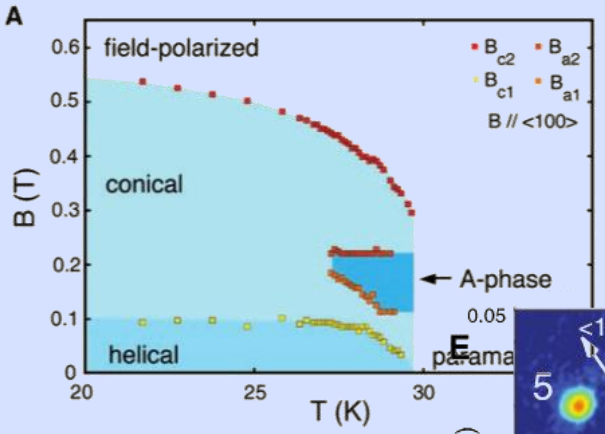


Skyrmions

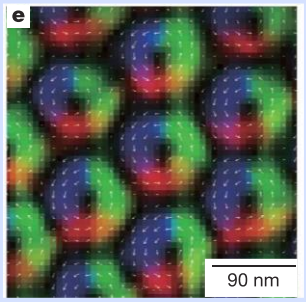
Motivations for 2017 topics. Example: chirality

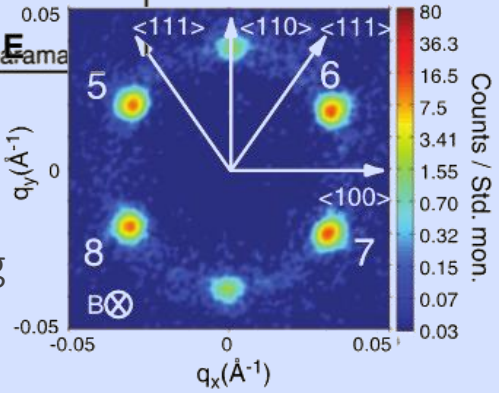
Skyrmions in bulk

MnSi



FeCoSi





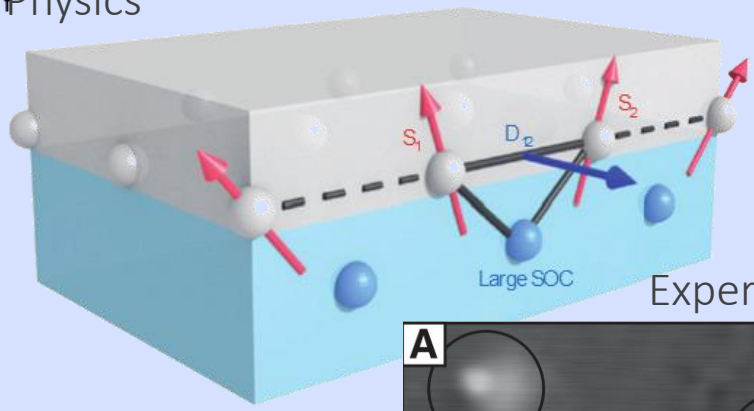
Small Angle
Neutron Scattering
Reciprocal space

Non-centrosym MnSi, FeGe,
FeCoSi metals, and Cu_2OSeO_3 insulator
Skyrmion hexagonal lattice

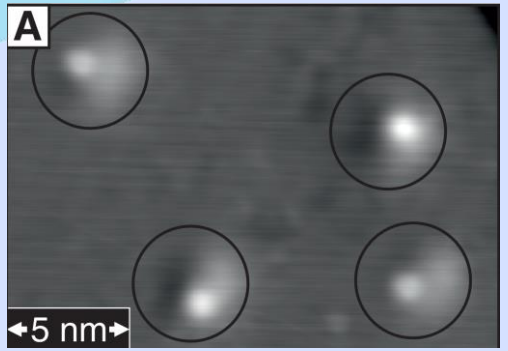
Mühlbauer *et al*. Science 2009
Yu *et al*. Nature 2010
Seki *et al*. Science 2012

Skyrmions in nano

Physics



Experiments

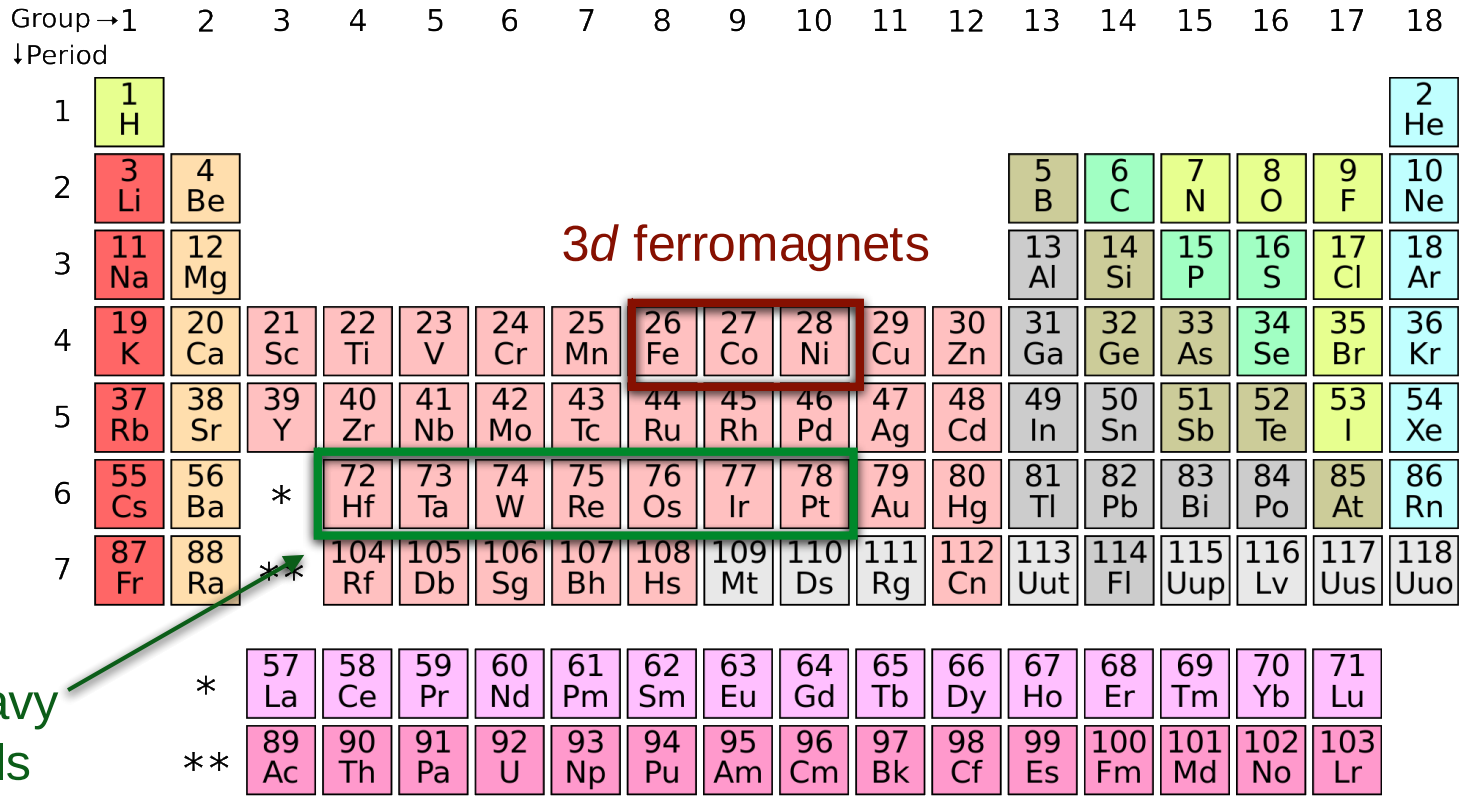


Devices ?

S. Heinze *et al*. Nat. Phys. 2011,
N. Romming, Science (2013)
Fert *et al*. Nat. Nanotech. 2013

Motivations for 2017 topics. Example: spin-orbit coupling

Coupling between spin and orbital angular momenta, short-range relativistic effect between first neighbors. Strongest for heavier atoms like Ir, Pt

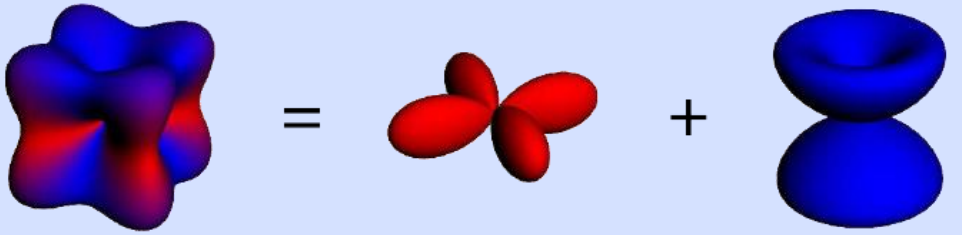


$$E_{SO} \sim \mathbf{L} \cdot \mathbf{S}$$

Motivations for 2017 topics. Example: spin-orbit coupling

Bulk

Recent interest in iridates
Prediction of a novel entangled spin-orbital state J_{eff}=1/2



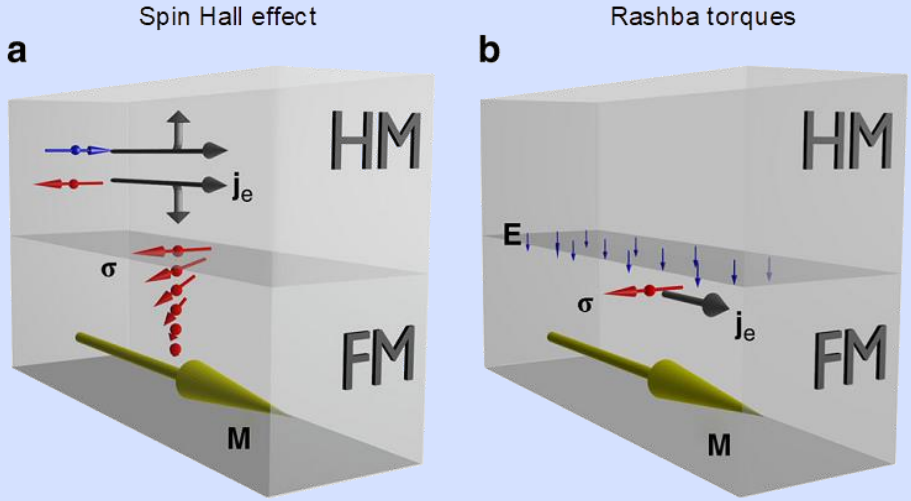
Consequences:

- Spin-orbit driven Mott insulator
- Topological phases
- New anisotropy of magnetic interactions leading to novel ground states (ex. Kitaev spin liquid) and excitations (ex. Majorana fermions)

Nano

Multilayers with heavy atoms (Pt, Ir, Ta)

- Strong Dzyaloshinskii-Moryia interactions-> skyrmions & chiral walls
- Rashba effect, spin-orbit torque, Hall effect -> magnetization manipulation & reading of spin currents



Enhanced-efficiency conversion effects for spintronic applications

Lecturers

I. Basic concepts
Fields, Units, Magnetostatics
Magnetism of atoms and ions

II. Magnetism in matter
Mean field theory of magnetic ordering
Magnetic interactions
Spin-orbit coupling and crystal electric field

III. General tools
Magnetic phase transitions, symmetry, magnetic structures.
Magnetic diffraction with neutrons and X-ray scattering
Measurement techniques: the nano side
Topology in Magnetism.

IV. Magnetization textures and dynamics
Spin waves and others excitations, bulk and nano
Domains and domain walls in ferroics

V. Materials and effects
Multiferroics
Magnetization processes in bulk and nano
Transport and magnetotransport
Magnetic frustration (bulk and nano)
Skyrmions and other chiral textures

IX. Career perspectives
Scientific publishing - Views and opportunities
Entering the industry job market after a PhD

Activities

	Monday 09/10/2017	Tuesday 10/10/2017	Wednesday 11/10/2017	Thursday 12/10/2017	Friday 13/10/2017	Saturday 14/10/2017	Sunday 15/10/2017	Monday 16/10/2017	Tuesday 17/10/2017	Wednesday 18/10/2017	Thursday 19/10/2017	Friday 20/10/2017	Saturday 21/10/2017
9h-9h30		**Opening/Intro.** Olivier Fruchart	**Magnetism of atoms** 2/2 Wulf Wulfhekel	**Ordering, mean field** 2/2 Wulf Wulfhekel	**Magnetic interactions** 1/2 Ingrid Mertig	**Transport** part 2/2 Laurent Ranno	Excursion's day	**CEF, SOC, anisotropy** Julie Staunton	**Excitation/spinwaves** part 1/2 Michel Kenzelmann	**Topology in Magnetism** Henrik Rønnow	**Frustration** part 2/2 Benjamin Canals	**Practicals/Library** (Kenzelmann, Canals, Simonet)	Departure
9h30-10h		Tutorial intro											
10h-10h30		Coffee	Coffee	Coffee	Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee	
10h30-11h		**Field/Units/ Magnetostatics** Laurent Ranno	**Questions**	**Practicals/Library** Fruchart, Ranno, Insnard)	**Symmetries, phase transition** 1/2 Laurent Chapon	**Symmetries, phase transition** 2/2 Laurent Chapon		**Questions**	**Frustration** part 1/2 Benjamin Canals	**Magnetization processes** 2/2 Christian Back	**Domain & Domain walls** Andres Cano	**Skyrmions Chiral structures** Henrik Rønnow	
11h-11h30													
11h30-12h													
12h-12h30													
12h30-13h													
13h-13h30		Lunch	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch	
13h30-14h													
14h-14h30		**Magnetism of atoms** 1/2 Wulf Wulfhekel	**Ordering, mean field** 1/2 Wulf Wulfhekel	Sports afternoon	**Transport** part 1/2 Laurent Ranno	**Magnetic interactions** 2/2 Ingrid Mertig		**Magnetization processes** 1/2 Christian Back	**Multiferroics** Andres Cano	**Questions**	**career perspectives Instrumentation** Gwilherm Nénert	**career perspectives Publishing** Yonko Millev	
14h30-15h	Arrival												
15h-15h30		clip poster	clip poster		clip poster	clip poster		Coffee	Coffee	Coffee	Coffee	Coffee	
15h30-16h		Coffee	Coffee		Coffee	Coffee		Poster Session	**Practicals/Library** (Kenzelmann, Millev, Simonet)	**Practicals/Library** (Canals, Millev, Simonet)	**Excitation/spinwaves** part 2/2 Michel Kenzelmann	**Question, Evaluation, and Closing** Virginie Simonet	
16h-16h30		**Techniques in Nano** Olivier Fruchart	**Techniques in bulk** Laurent Chapon		**Questions**	**Practicals/Library** (Fruchart, Ranno, Insnard)							
16h30-17h													
17h-17h30													
17h30-18h													
18h-18h30		Welcome party											
18h30-19h													
19h-19h30													
19h30-20h										Banquet			
20h-20h30													

- 40h interactive lectures
- Question sessions (8h)
- Practicals (6h per student)
- Poster session
- Library dedicated to magnetism
- Social activities
- Industrial perspectives
- Final critical analysis by students

Lectures

⇨ Lecturers may be stopped to request (re)explanations, raise questions etc.

⇨ Profile and dates on-site for each lecturer are displayed on lecturers poster

⇨ All slides online shortly after the end of the lecture

⇨ Repository of all lectures since 2003: http://magnetism.eu/school/repository

Question sessions

	Monday 09/10/2017	Tuesday 10/10/2017	Wednesday 11/10/2017	Thursday 12/10/2017	Friday 13/10/2017	Saturday 14/10/2017	Sunday 15/10/2017	Monday 16/10/2017	Tuesday 17/10/2017	Wednesday 18/10/2017	Thursday 19/10/2017	Friday 20/10/2017	Saturday 21/10/2017
9h-9h30		**Opening/Intro.** Olivier Fruchart	**Magnetism of atoms** 2/2 Wulf Wulfhekel	**Ordering, mean field** 2/2 Wulf Wulfhekel	**Magnetic interactions** 1/2 Ingrid Mertig	**Transport** part 2/2 Laurent Ranno	Excursion's day	**CEF, SOC, anisotropy** Julie Staunton	**Excitation/spinwaves** part 1/2 Michel Kenzelmann	**Topology in Magnetism** Henrik Rønnow	**Frustration** part 2/2 Benjamin Canals	**Practicals/Library** (Kenzelmann, Canals, Simonet)	Departure
9h30-10h		Tutorial Intro	Wulf Wulfhekel	Wulf Wulfhekel	Ingrid Mertig	Laurent Ranno		Julie Staunton	Michel Kenzelmann	Henrik Rønnow	Benjamin Canals		
10h-10h30		Coffee	Coffee	Coffee	Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee	
10h30-11h		**Field/Units/ Magnetostatics** Laurent Ranno	**Questions**	**Practicals/Library** Fruchart, Ranno, Isnard)	**Symmetries, phase transition** 1/2 Laurent Chapon	**Symmetries, phase transition** 2/2 Laurent Chapon		**Questions**	**Frustration** part 1/2 Benjamin Canals	**Magnetization processes** 2/2 Christian Back	**Domain & Domain walls** Andres Cano	**Skyrmions Chiral structures** Henrik Rønnow	
11h-11h30													
11h30-12h													
12h-12h30													
12h30-13h		Lunch	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch	
13h-13h30													
13h30-14h													
14h-14h30		**Magnetism of atoms** 1/2 Wulf Wulfhekel	**Ordering, mean field** 1/2 Wulf Wulfhekel	Sports afternoon	**Transport** part 1/2 Laurent Ranno	**Magnetic interactions** 2/2 Ingrid Mertig		**Magnetization processes** 1/2 Christian Back	**Multiferroics** Andres Cano	**Questions**	**career perspectives Instrumentation** Gwilherm Nénert	**career perspectives Publishing** Yonko Millev	
14h30-15h	Arrival	clip poster	clip poster		clip poster	clip poster		Coffee	Coffee	Coffee	Coffee	Coffee	
15h-15h30		Coffee	Coffee		Coffee	Coffee		**Poster Session**	**Practicals/Library** (Kenzelmann, Millev, Simonet)	**Practicals/Library** (Canals, Millev, Simonet)	**Excitation/spinwaves** part 2/2 Michel Kenzelmann	**Question, Evaluation, and Closing** Virginie Simonet	
15h30-16h		**Techniques in Nano** Olivier Fruchart	**Techniques in bulk** Laurent Chapon		**Questions**	**Practicals/Library** (Fruchart, Ranno, Isnard)							
16h-16h30													
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17h-17h30													
17h30-18h													
18h-18h30		Welcome party											
18h30-19h													
19h-19h30													
19h30-20h													
20h-20h30										Banquet			

⇨ Post questions in the question box ahead of the session

⇨ Answers prepared by the lecturers

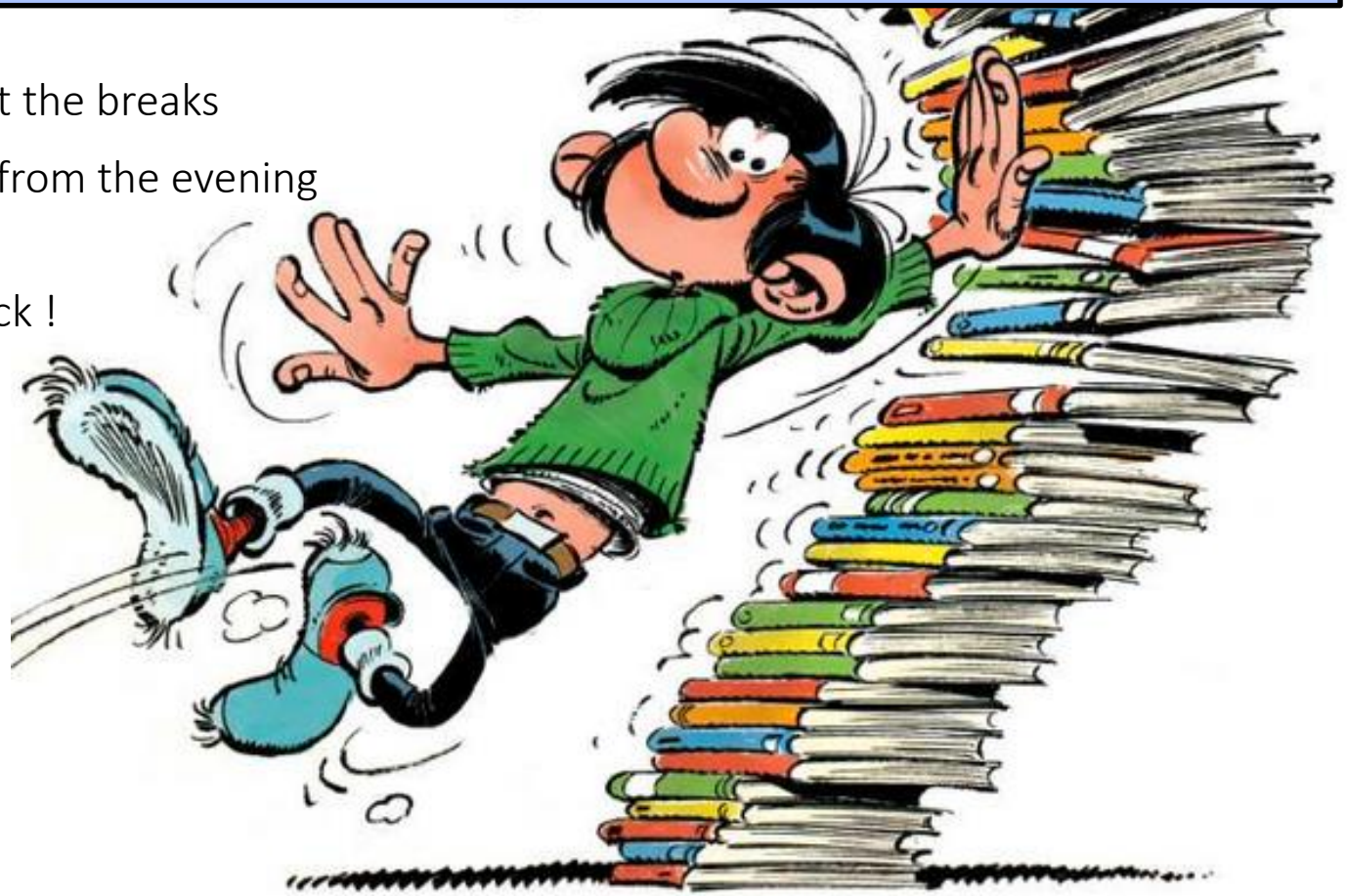
Posters

Tuesday 10/10/2017	Wednesday 11/10/2017	Thursday 12/10/2017	Friday 13/10/2017	Saturday 14/10/2017	Sunday 15/10/2017	Monday 16/10/2017	Tuesday 17/10/2017	Wednesday 18/10/2017	Thursday 19/10/2017	Friday 20/10/2017
Opening/Intro. Olivier Fruchart Tutorial Intro	**Magnetism of atoms** 2/2 Wulf Wulf Hekel	**Ordering, mean field** 2/2 Wulf Wulf Hekel	**Magnetic interactions** 1/2 Ingrid Mertig	**Transport** part 2/2 Laurent Ranno	Excursion's day	**CEF, SOC, anisotropy** Julie Staunton	**Excitation/spinwaves** part 1/2 Michel Kenzelmann	**Topology in Magnetism** Henrik Rønnow	**Frustration** part 2/2 Benjamin Canals	**Practicals/Library** (Kenzelmann, Canals, Simonet)
Coffee	Coffee	Coffee	Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee
Field/Units/ Magnetostatics Laurent Ranno	**Questions**	**Practicals/Library** Fruchart, Ranno, Isnard)	**Symmetries, phase transition** 1/2 Laurent Chapon	**Symmetries, phase transition** 2/2 Laurent Chapon		**Questions**	**Frustration** part 1/2 Benjamin Canals	**Magnetization processes** 2/2 Christian Back	**Domain & Domain walls** Andres Cano	**Skyrmions Chiral structures** Henrik Rønnow
Lunch	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch
Magnetism of atoms 1/2 Wulf Wulf Hekel clip poster	**Ordering, mean field** 1/2 Wulf Wulf Hekel clip poster	Sports afternoon	**Transport** part 1/2 Laurent Ranno clip poster	**Magnetic interactions** 2/2 Ingrid Mertig clip poster		**Magnetization processes** 1/2 Christian Back	**Multiferroics** Andres Cano	**Questions**	**career perspectives Instrumentation** Gwilherm Nénert	**career perspectives Publishing** Yonko Millev
Coffee	Coffee		Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee
Techniques in Nano Olivier Fruchart	**Techniques in bulk** Laurent Chapon		**Questions**	**Practicals/Library** (Fruchart, Ranno, Isnard)		**Poster Session**	**Practicals/Library** (Kenzelmann, Millev, Simonet)	**Practicals/Library** (Canals, Millev, Simonet)	**Excitation/spinwaves** part 2/2 Michel Kenzelmann	**Question, Evaluation, and Closing** Virginie Simonet
Welcome party								Banquet		

- 1-2 slides presentation by each participant
- Upload slides at breaks
- 90-second presentation
- Poster session on Monday 16th

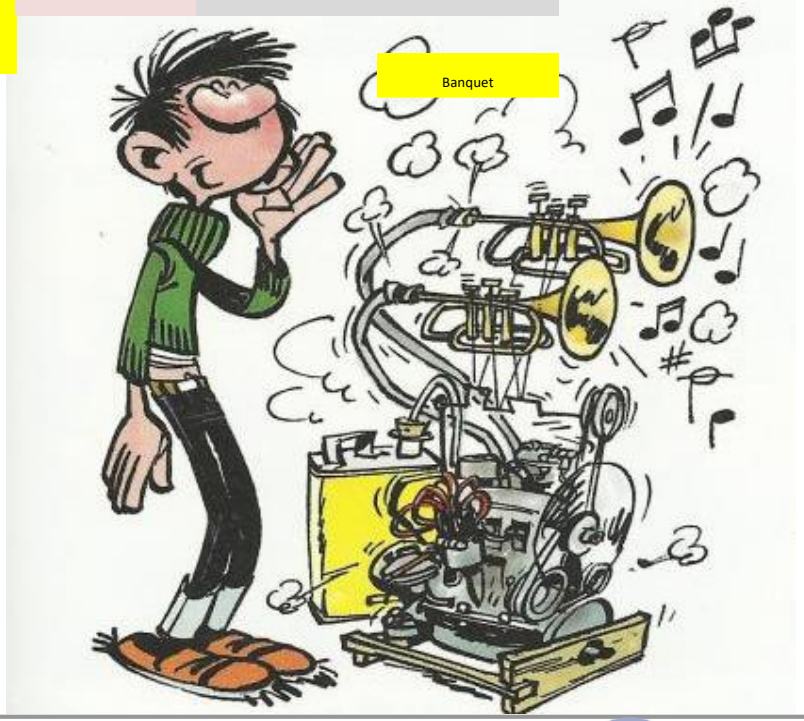
Library

- Browse books any time at the breaks
- Books may be borrowed from the evening to the next morning
- Please bring all books back !



Dancing party after the banquet

Tuesday 10/10/2017	Wednesday 11/10/2017	Thursday 12/10/2017	Friday 13/10/2017	Saturday 14/10/2017	Sunday 15/10/2017	Monday 16/10/2017	Tuesday 17/10/2017	Wednesday 18/10/2017	Thursday 19/10/2017	Friday 20/10/2017
Opening/Intro. Olivier Fruchart Tutorial Intro	**Magnetism of atoms 2/2** Wulf Wulfhekel	**Ordering, mean field 2/2** Wulf Wulfhekel	**Magnetic interactions 1/2** Ingrid Mertig	**Transport** part 2/2 Laurent Ranno	Excursion's day	**CEF, SOC, anisotropy** Julie Staunton	**Excitation/spinwaves** part 1/2 Michel Kenzelmann	**Topology in Magnetism** Henrik Rønnow	**Frustration** part 2/2 Benjamin Canals	**Practicals/Library** (Kenzelmann, Canals, Simonet)
Coffee	Coffee	Coffee	Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee
Field/Units/ Magnetostatics Laurent Ranno	**Questions**	**Practicals/Library** Fruchart, Ranno, Insnard)	**Symmetries, phase transition 1/2** Laurent Chapon	**Symmetries, phase transition 2/2** Laurent Chapon		**Questions**	**Frustration** part 1/2 Benjamin Canals	**Magnetization processes 2/2** Christian Back	**Domain & Domain walls** Andres Cano	**Skyrmions Chiral structures** Henrik Rønnow
Lunch	Lunch	Lunch	Lunch	Lunch		Lunch	Lunch	Lunch	Lunch	Lunch
Magnetism of atoms 1/2 Wulf Wulfhekel clip poster	**Ordering, mean field 1/2** Wulf Wulfhekel clip poster	Sports afternoon	**Transport** part 1/2 Laurent Ranno clip poster	**Magnetic interactions 2/2** Ingrid Mertig clip poster		**Magnetization processes 1/2** Christian Back	**Multiferroics** Andres Cano	**Questions**	**career perspectives Instrumentation** Gwilherm Nénert	**career perspectives Publishing** Yonko Millev
Coffee	Coffee		Coffee	Coffee		Coffee	Coffee	Coffee	Coffee	Coffee
Techniques in Nano Olivier Fruchart	**Techniques in bulk** Laurent Chapon		**Questions**	**Practicals/Library** (Fruchart, Ranno, Insnard)		**Poster Session**	**Practicals/Library** (Kenzelmann, Millev, Simonet)	**Practicals/Library** (Canals, Millev, Simonet)	**Excitation/spinwaves** part 2/2 Michel Kenzelmann	**Question, Evaluation, and Closing** Virginie Simonet
Welcome party								Banquet		



- Should be self-organized
- Sound equipment available at IESC
- **Seeking a DJ volunteer to coordinate efforts**

- Other social activities discussed on later days

Stay in touch on Facebook

https://www.facebook.com/groups/EuropeanSchoolOnMagnetism/

http://opn.to/a/QGCkb

- Organization updates
- Outings & parties
- Stay in touch after ESM

Timetable of ESM2017 – Tuesday 10th

9h-10h	**O. Fruchart** *Opening / Introduction*	
10h-10h30	**Tutorials intro**	
10h30-11h	Coffee	
11h-12h30	Chair : O. Fruchart	**L. Ranno** *Field / Units / Magnetostatics*
12h30 - 13h30	Lunch	
13h30-14h		
14h-15h30	Chair : O. Isnard	**W. Wufhekel** *Magnetism of atoms and ions (1/2)*
15h30-16h	**Poster clips**	
16h-16h30	Coffee	
16h30-18h	Chair : O. Isnard	**O. Fruchart** *Techniques for Nano*
18h-19h30	**Welcome party**	