

Sept. 29 to Oct. 3, 2014

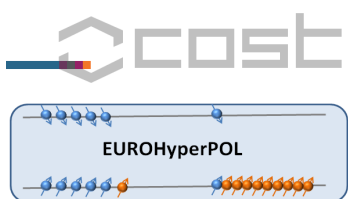
# Hyperpolarised Noble Gases

## École de Physique des Houches



# Program





## --- PROGRAM ---

### Sunday, September 28, 2014

3:00 pm - 7:00 pm      Arrival - Welcome and registration

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7:30 pm - 8:30 pm      Dinner

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### Monday, September 29, 2014

7:45 am - 8:45 am      Breakfast

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9:00 am - 9:10 am      Welcome

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#### 9:10 am - 10:40 am      **HP gas lung MRI**

09:10 - 09:40      › Historical Overview and Future Perspectives of HPNG from the University of Virginia 1996-2014 - *James Brookeman, University of Virginia School of Medicine*

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09:55 - 10:25      › Dynamic MRI of HP  $^3\text{He}$  in Asthma - *Sean Fain, University of Wisconsin-Madison [Madison]*

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10:40 am - 11:00 am      Break

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#### 11:00 am - 12:20 pm      **HP gas lung MRI**

11:00 - 11:20      › Feasibility of Human Lung Ventilation MR Imaging using Naturally-Abundant  $^{129}\text{Xe}$  with Optimised 3D SSFP - *Neil Stewart, University of Sheffield*

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11:25 - 11:45      › Comprehensive and Quantitative Evaluation of Radiation-induced Lung Injury by Hyperpolarized Xenon MRI - *Xin Zhou, Key Laboratory of Magnetic Resonance in Biological Systems, State Key Laboratory of Magnetic Resonance and Atomic and Molecular Physics, National Center for Magnetic Resonance in Wuhan, Wuhan Institute of Physics and Mathematics, CAS*

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11:50 - 12:10      › Exploration of TRASE MRI at low field with hyperpolarized  $^3\text{He}$  - *Christopher Bidinosti, Department of Physics, University of Winnipeg*

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12:30 pm - 1:30 pm      Lunch

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#### 2:30 pm - 5:10 pm      **HP gas lung MRI**

14:30 - 15:00      › Gas diffusion in porous media - *Denis Grebenkov, Laboratory of Condensed Matter Physics, CNRS*

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15:15 - 15:45      ›  $^3\text{He}$  Diffusion MRI of the Lung: validity in different physical regimes - *Jason Woods, Cincinnati Children's Hospital Medical Center, Washington University*

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16:00 - 16:30      › Models and measurements of hyperpolarized gas diffusion in lungs - *Juan Parra-Robles, Academic Radiology, University of Sheffield*

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7:00 pm - 7:30 pm      Welcome drink

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7:30 pm - 8:30 pm      Dinner

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## Tuesday, September 30, 2014

7:45 am - 8:45 am	Breakfast
<b>9:00 am - 10:30 am</b>	<b>Applications in neutron science and fundamental physics</b>
09:00 - 09:30	› Fundamental Symmetry Experiments with Polarized Noble Gases - <i>Timothy Chupp, Randall Laboratory, University of Michigan [Ann Arbor]</i>
09:45 - 10:15	› The benefits of long T2* : From fundamental physics to applied research - <i>Werner Heil, Johannes Gutenberg University</i>
10:30 am - 11:00 am	Break
<b>11:00 am - 12:20 pm</b>	<b>Applications in neutron science and fundamental physics</b>
11:00 - 11:30	› Polarized 3He spin filters for neutron science - <i>Thomas Gentile, U.S. National Institute of Standards and Technology</i>
11:45 - 12:05	› SEOP polarization in difficult environments - <i>Earl Babcock, JCNS</i>
12:10 - 12:15	› Overview of polarized 3He production, 3He cells and dedicated equipments for ILL neutron instruments - <i>David Jullien, Institut Laue-Langevin (5 min. poster clip)</i>
12:15 - 12:20	› Xenon EDM measurements utilizing free spin precession - <i>Isaac Fan, Physikalisch-Technische Bundesanstalt (5 min. poster clip)</i>
12:30 pm - 1:30 pm	Lunch
<b>2:30 pm - 4:30 pm</b>	<b>Applications in neutron science and fundamental physics</b>
14:30 - 14:50	› Probing sub-eV particles with polarized Helium 3 - <i>Mathieu Guigue, Laboratoire de Physique Subatomique et de Cosmologie</i>
14:55 - 15:15	› Achieving accurate tip angles in NMR at low magnetic field - <i>Pierre-Jean Nacher, Laboratoire Kastler Brossel</i>
15:20 - 15:40	› Spontaneous NMR precession in hyperpolarised 3He - <i>Genevieve Tastevin, Laboratoire Kastler Brossel</i>
6:30 pm - 7:15 pm	History and recollections: optical pumping and applications - Brian Saam and Michèle Leduc
7:30 pm - 8:30 pm	Special dinner

## Wednesday, October 1, 2014

7:45 am - 8:45 am	Breakfast
<b>9:00 am - 10:30 am</b>	<b>Optical pumping physics</b>
09:00 - 09:30	› Synchronous Spin Exchange Optical Pumping - <i>Thad Walker, University of Wisconsin-Madison</i>
09:45 - 10:15	› Characterizing and modeling the efficiency limits in large-scale production of hyperpolarized $^{129}\text{Xe}$ - <i>Bastiaan Driehuys, Duke university [Durham]</i>
10:30 am - 11:00 am	Break
<b>11:00 am - 12:15 pm</b>	<b>Optical pumping physics</b>
11:00 - 11:20	› $^3\text{He}$ SEOP via D1 line based on ultra-narrow band diode laser - <i>Alexander Petukhov, Institut Laue-Langevin</i>
11:25 - 11:45	› Advances in $^3\text{He}$ spin exchange optical pumping for neutron spin filter applications at the NCNR - <i>Wangchun Chen, University of Maryland and National Institute of Standards and Technology</i>
11:50 - 11:55	› Using in situ Raman and NMR Spectroscopies to Map the Dependences of Spin-Exchange Optical Pumping and Energy Transport on Xenon Density - <i>Jason Skinner, School of Medicine, University of Nottingham (5 min poster clip)</i>
11:55 - 12:00	› High $^{129}\text{Xe}$ polarisation (80%) on a home-built SEOP system - <i>Graham Norquay, University of Sheffield (5 min poster clip)</i>
12:00 - 12:05	› Cryogen-Free Concentration of Hyperpolarized $^{129}\text{Xe}$ Gas in a Continuously Flowing Stream of Gas - <i>Wolfgang Kilian, Physikalisch-Technische Bundesanstalt (5 min poster clip)</i>
12:05 - 12:10	› $^3\text{He}$ polarizer for human lung MRI operating in a 1.5 T medical scanner under non standard MEOP conditions - <i>Bartosz Glowacz, Jagiellonian University, Faculty of Physics, Astronomy and Applied Computer Science</i>
12:10 - 12:15	› Novel SEOP $^{129}\text{Xe}$ polarizer for medical and material studies - <i>Anna Wojna-Pelczar, Jagiellonian University (5 min poster clip)</i>
12:30 pm - 1:30 pm	Lunch
7:30 pm - 8:30 pm	Dinner

## Thursday, October 2, 2014

7:45 am - 8:45 am	Breakfast
<b>9:00 am - 10:30 am</b>	<b>HP gas NMR in biology and chemistry</b>
09:00 - 09:30	› Hyperpolarized xenon for probing biological processes - <i>Patrick Berthault, Commissariat à l'Energie Atomique et aux Energies Alternatives - Saclay</i>
09:45 - 10:15	› Hyperpolarized <sup>83</sup> Kr MRI - from basic physics to biomedical applications. - <i>Thomas Meersmann, University of Nottingham, Sir Peter Mansfield Magnetic Resoance Centre, School of Medicine</i>
10:30 am - 11:00 am	Break
<b>11:00 am - 12:20 pm</b>	<b>HP gas NMR in biology and chemistry</b>
11:00 - 11:20	› Mechanism of Xenon-Cryptophane-A Complexation in Aqueous Solution - <i>Lorenz Mitschang, Physikalisch-Technische Bundesanstalt</i>
11:25 - 11:45	› Spectroscopy of dissolved <sup>129</sup> Xe in the human brain at 1.5T - <i>Madhwesha Rao, University of Sheffield</i>
11:50 - 12:10	› Multinuclear lung MRI for therapy design and assessment - <i>Jim Wild, University of Sheffield</i>
12:30 pm - 1:30 pm	Lunch or lunch box
12:30 pm - 7:00 pm	<b>Excursion - Chamonix, Aiguille du Midi (depending on weather), with lunch box</b>
7:30 pm - 8:30 pm	Dinner, mountain style

## Friday, October 3, 2014

7:45 am - 8:45 am	Breakfast
<b>9:30 am - 11:30 am</b>	<b>Relaxation</b>
09:30 - 10:00	› <sup>129</sup> Xe T1 and how to keep it long - <i>Brian Saam, Department of Physics &amp; Astronomy, University of Utah</i>
10:15 - 10:35	› <sup>129</sup> Xe chemical shift and spin-lattice relaxation dependence on blood oxygenation - <i>Graham Norquay, University of Sheffield</i>
10:40 - 11:00	› Long storage times for hyperpolarized <sup>129</sup> Xe and precise measurement of its absolute polarization - <i>Maricel Repetto, Johannes Gutenberg University</i>
11:05 - 11:25	› AC Spin Manipulation at ultra low fields for T1 determination of hyperpolarized rare gases - <i>Wolfgang Kilian, Physikalisch-Technische Bundesanstalt</i>
12:30 pm - 1:30 pm	Lunch
1:30 pm - 2:00 pm	The End - farewell and departure