INTENSITY

frontier

GDR-InF

Latest news from the GDR-InF

Annual GDR-InF meeting,
Arles, Nov 5-7 2018

Aoife Bharucha - Francesco Polci

The GDR-InF Community

- GDR-InF created on January 2017
- 61 senior physicists
- 14 laboratories of IN2P3, INP, CEA
- Many students and postdocs
- New members welcome!

Allocated budget:
Initially was 15000 euros per year
Increased to 17000 euros in 2018!

Asmaa Abada[14], Ziad Ajaltouni[11], Yasmine Amhis[10], Sergey Barsuk[10], Nicole Bastid[11], Jerome Baudot[7], Damir Becirevic[14], Karim Benakli[15], Eli Ben-Haim[12], Véronique Bernard[4], Aoife Bharucha[2], Benoit Blossier[14], Philippe Boucaud[14], Jerome Charles[2], Matthew John Charles[12], Jacques Chauveau[12], Max Chefdeville[8], Julien Cogan[1], Eric Cogneras[11], Philippe Crochet[11], Wilfrid Da Silva[12], Sascha Davidson[5], Cedric Delaunay[9], Luigi Del Buono[12], Olivier Deschamps[11], Sebastien Descotes-Genon[14], Benjamin Fuks[15], Vladimir Gligorov[12], Mark Goodsell[15], Diego Guadagnoli[9], Frederic Kapusta[12], Marc Knecht[2], Emi Kou[10], Witek Krasny[12], Stephane Lavignac[6], Francois Le Diberder[10], Régis Lefèvre[11], Renaud Le Gac[1], Laurent Lellouch[2], Olivier Leroy[1], Frederic Machefert[10], Giampiero Mancinelli[1], Mariane Mangine Brinet[13], Nazila Farvah Mahmoudi[3], Jean Francois Marchand[8], Stephane Monteil[11], Vincent Morenas[11], Jean Orloff[11], Pascal Perret[11], Francesco Polci[12], Sarah Porteboeuf[11], Isabelle Ripp-Baudot[7], Patrick Robbe[10], Marie-Hélène Schune[10], Justine Serrano[1], Christopher Smith[13], Ana Teixeira[11], Vincent Tisserand[8], Stephane T'Jampens[8], Edwige Tournefier[8], Guy Wormser[10]

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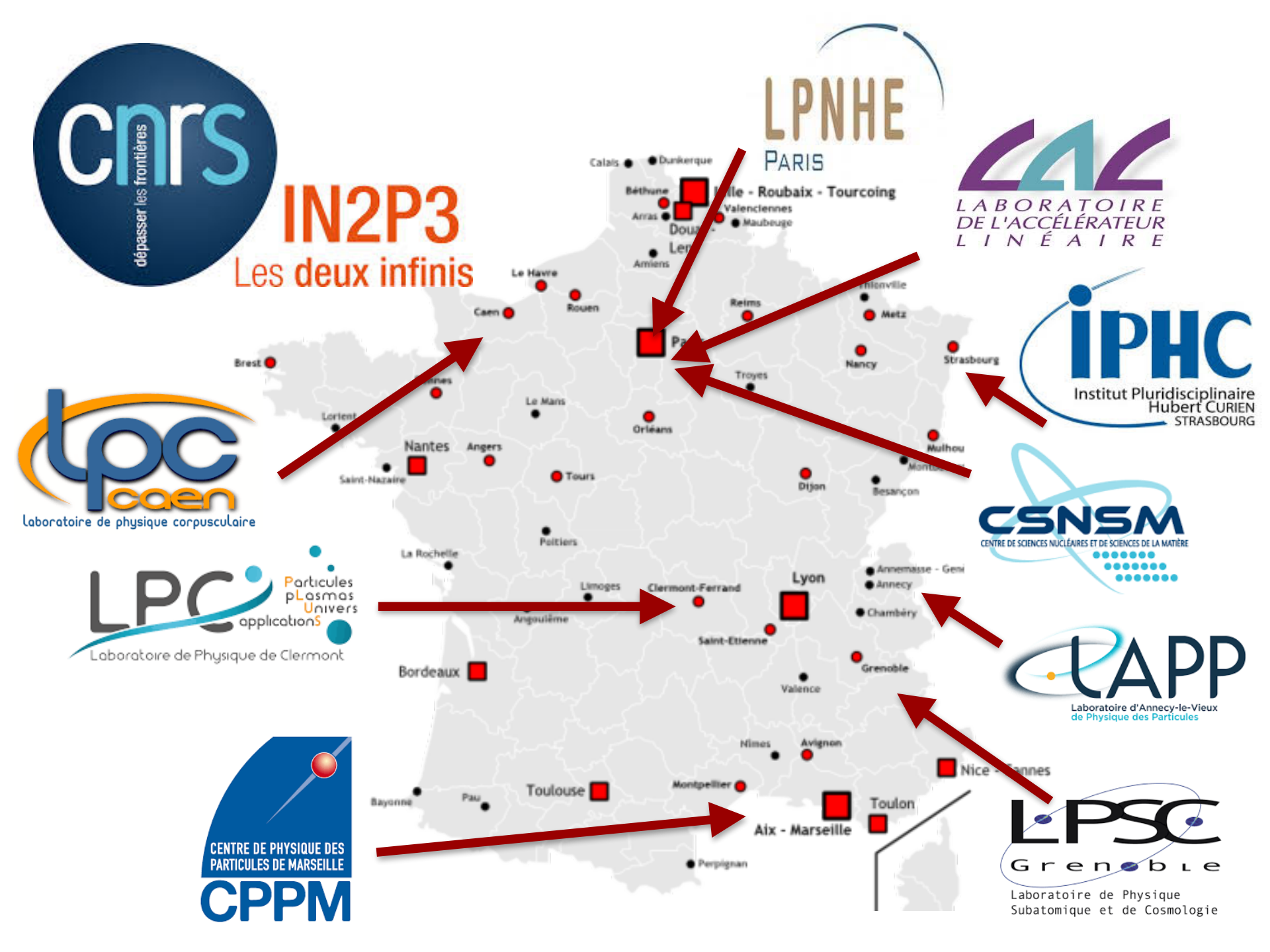
[2] *Centre de Physique Théorique (CPT), Marseille;*
[3] *Centre de Recherche Astrophysique de Lyon (CRAL), Lyon*
[4] *Institut de Physique Nucléaire (IPN), Orsay*
[5] *Institut de Physique Nucléaire de Lyon (IPNL), Lyon*
[6] *Institut de Physique Théorique (IPhT), CEA Saclay*
[7] *Institut Pluridisciplinaire Hubert Curien (IPHC), Strasbourg*
[8] *Laboratoire d'Annecy-Le-Vieux de Physique de Particules (LAPP), Annecy-Le-Vieux*
[9] *Laboratoire d'Annecy-Le-Vieux de Physique Théorique (LAPTh), Annecy-Le-Vieux*
[10] *Laboratoire de l'Accélérateur Lineaire (LAL), Orsay*
[11] *Laboratoire de Physique Corpuscolaire (LPC), Clermont-Ferrand*
[12] *Laboratoire de Physique Nucléaires et des Hautes Energies (LPNHE), Paris;*
[13] *Laboratoire de Physique Subatomique et Cosmologie (LPSC), Grenoble*
[14] *Laboratoire de Physique Théorique (LPT), Orsay*
[15] *Laboratoire de Physique Théorique et Hautes Energies (LPTHE), Paris*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IN2P3
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PARIS
LAL
LABORATOIRE DE L'ACCÉLÉRATEUR LINÉAIRE
IPHC
Institut Pluridisciplinaire Hubert CURIEN
STRASBOURG
lpc caen
Laboratoire de physique corpusculaire
CSNSM
CENTRE DE SCIENCES NUCLÉAIRES ET DE SCIENCES DE LA MATIÈRE
LPC
Particules pLasmas Univers applicationS
Laboratoire de Physique de Clermont
LAPP
Laboratoire d'Annecy-le-Vieux de Physique des Particules
CENTRE DE PHYSIQUE DES PARTICULES DE MARSEILLE
CPPM
LPSC
Grenoble
Laboratoire de Physique Subatomique et de Cosmologie
Calais
Dunkerque
Béthune
Arras
Valenciennes
Maubeuge
Amiens
Le Havre
Caen
Rouen
Reims
Metz
Nancy
Strasbourg
Brest
Troyes
Lorient
Le Mans
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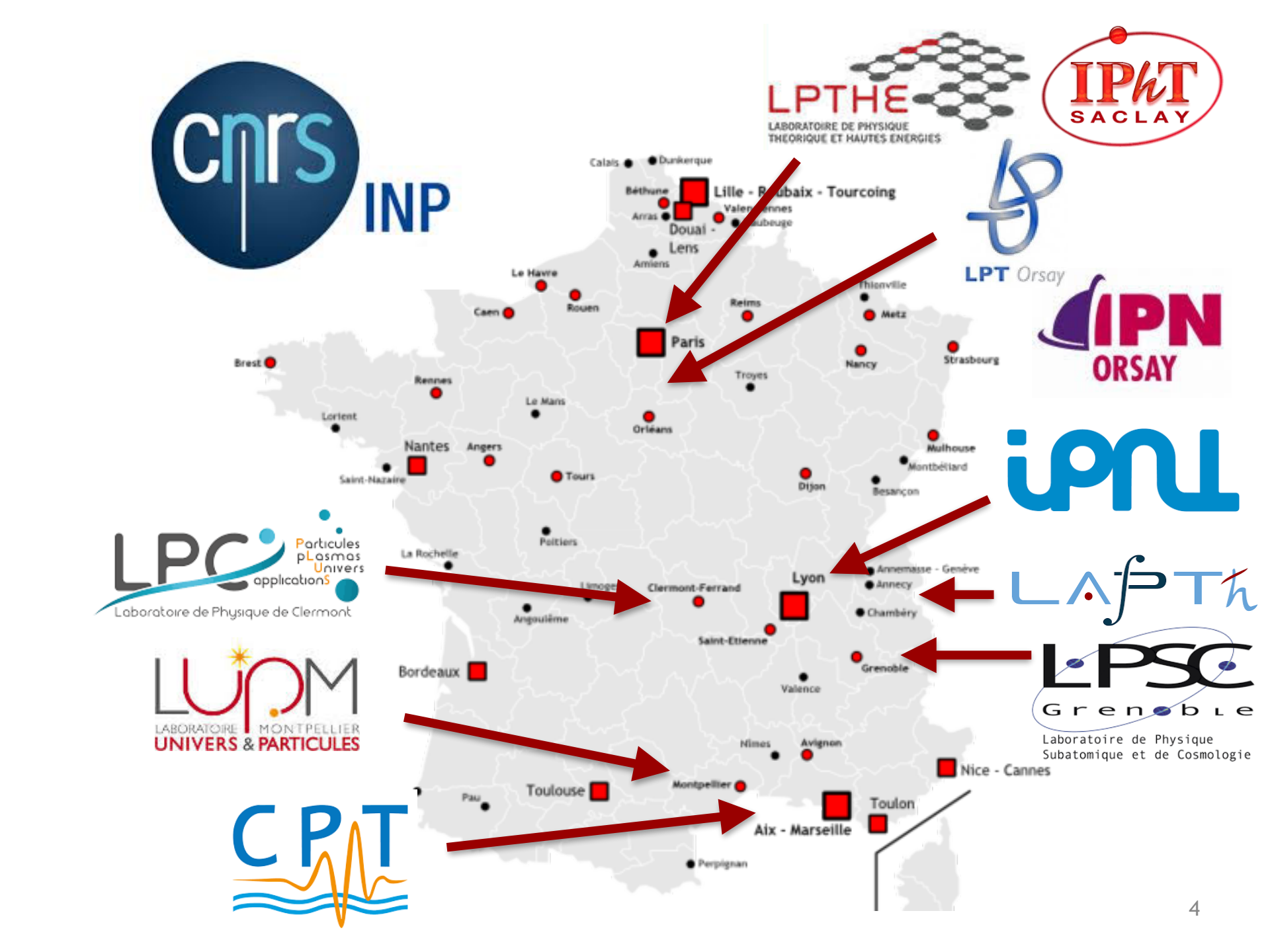
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LUPM
LABORATOIRE MONTPELLIER
UNIVERS & PARTICULES
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Calais
Dunkerque
Béthune
Lille - Roubaix - Tourcoing
Arras
Douai - Lens
Amiens
Le Havre
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Nice - Cannes
Montpellier
Pau
Toulouse
Toulon
Aix - Marseille
Perpignan

Contact persons for laboratories involved

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Nazila Mahmoudi (IPNL)
Stephane Lavignac (IPhT, CEA)
Isabelle Ripp-Baudot (IPHC)
Stephane T'Jampens (LAPP)
Diego Guadagnoli (LAPTh)
Marie-Helene Schune (LAL)
Christopher Smith (LPSC)
Sebastien Descotes-Genon (LPT)
Mark Goodsell (LPTHE)
Jérôme Charles (CPT)

Working Groups 1&2

- **CP violation:** (Convenors: Christopher Smith, Jean-Francois Marchand, Stephanie Roccia) Since the B-factories, CP violation in the quark sector has also been proven to be a precise test of the SM, through the measurement of the parameters of the CKM matrix. This measurement has room for improvement, and LHCb and Belle II will provide further insight on it, as well as additional tests involving the Bs meson and b baryons.

- **Rare, radiative and semi-leptonic B decays; Charm and Kaon Physics:** (Convenors: Yasmine Amhis, Diego Guadagnoli) Generally mediated by loops, rare decays are powerful probe of NP. LHCb finds exciting hints of deviations from the SM; certainly deserves to be further analysed and deeply understood. Given the present experimental opportunities, a renewed interest in Kaon and charmed meson decays decays is emerging, as they provide complementary ways to search for NP effects. Although for the charm physics there is already a large production of data, for the kaons some experimental challenges need to be faced and additional theoretical observables are being proposed.

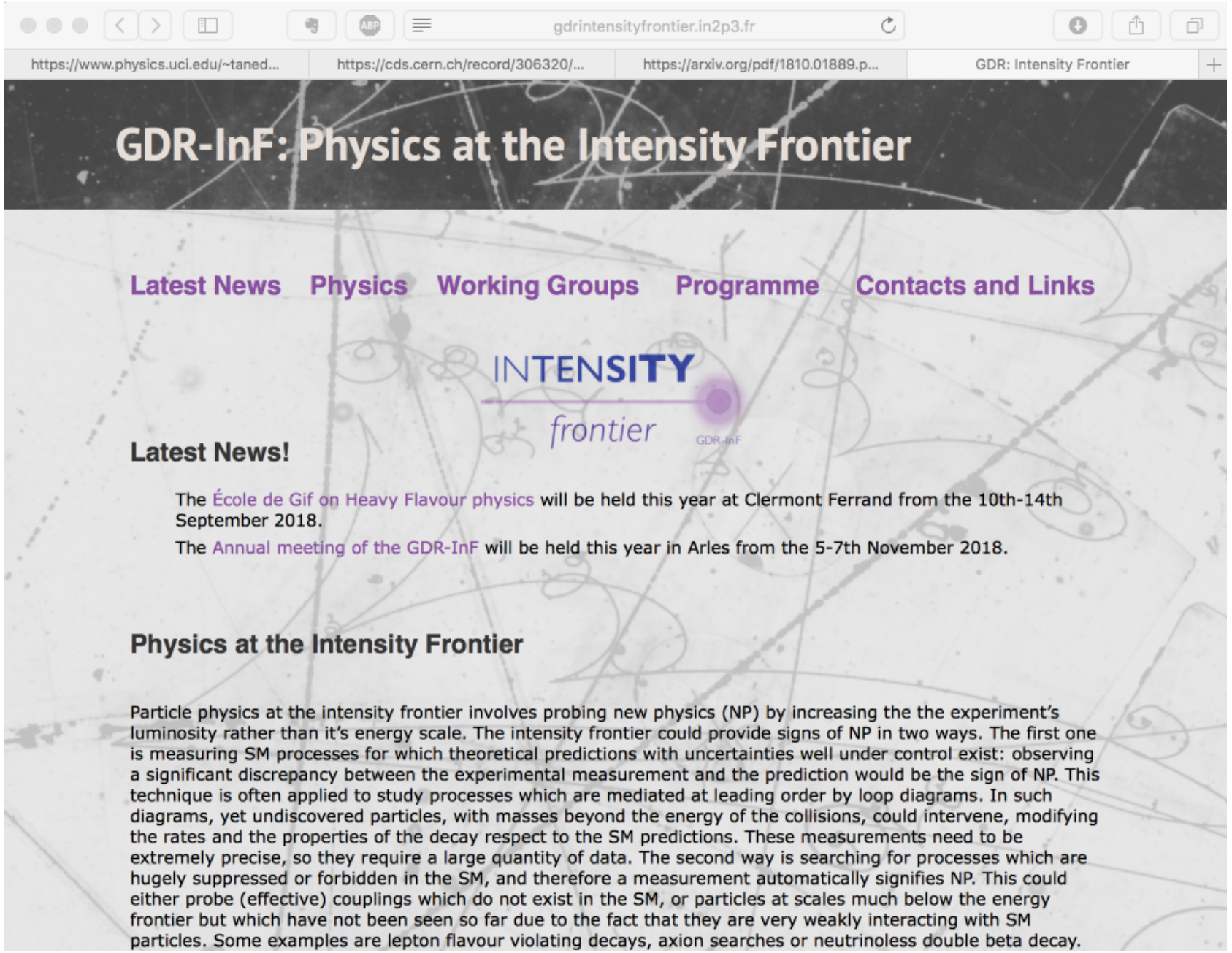
Working Groups 3,4,5

- **Heavy flavour production and spectroscopy:** (Convenors: Matthew Charles, Emi Kou) Ideal framework to test QCD predictions and provides crucial inputs for other measurements e.g. BSM searches. Recently revealed quarks can form more complex structures than previously believed, i.e. tetraquarks and pentaquarks

- **Interplay of quark and lepton flavour:** (Convenors: Ana Teixeira, Justine Serrano) Flavour violation in charged lepton sector clear sign of NP, many experiments directly searching for it. Some of most interesting hints for NP observed in lepton flavour universality tests in B meson decays, an approach involving both quark and lepton sectors is mandatory

- **Future experiments:** (Convenors: Mark Goodsell, Stephane Monteil) Beneficial to discuss future of our field, now when future upgrades of the LHCb experiment as well as new experiments being proposed. The GDR could help in identifying the priorities for French involvement in order to continue to play an active role

WG2 may be merging with WG4. WG3 might be temporarily suppressed.
Any thoughts or comments about the working group structure?



for the latest news go to gdrintensityfrontier.in2p3.fr

Types of GDR Meetings

With the aim of bringing our community together via events taking non-traditional formats, we have come up with the followings types of meetings:

1. Intensity lectures: Lectures on a blackboard, theory and experiment alternated, recorded, possibly published
2. Intensity brainstorming: Following the model: white cards + roundtable
3. Topical workshops: To sit down and work on a specific subject
4. Supported workshops: Not directly organized by GDR-InF, but of interest for our community
5. Annual general GDR meeting: To report on the activities, present the ongoing work in our community, hear from external speakers on topics/experiments on which we are not directly implied

Keeping the door open to any other desired format!

Previous events

- Workshop in Marseille on b to s transitions, October 2015
- Workshop in Paris on LFV/LFUV, November 2016
- GDR-InF Kickoff meeting, Institut Henri Poincaré, March 29-31 2017
- Rencontres de Physique des Particules, Marseille April 24-26 2017
- The 2nd LHCb open semitauonic workshop on Nov 13 and 14 at LAL
- Journée SHiP/Physique du secteur caché, Wednesday October 11, 2017, LPNHE
- GDR-Intensity lectures: from theory to experiments and everything in between, "LF(U)V in B decays", Paris, 26th to 27th October 2017
- GDR-InF workshop: The future of the intensity frontier? CERN, 1st-2nd February 2018
- GDR-Intensity lectures: from theory to experiments and everything in between, "LF(U)V in B decays-II" Paris, 13th-14th February 2018
- Workshop on the Strong CP puzzle and Axions, organised by Christopher Smith, Diego Guadagnoli, Guillaume Pignol, Jeremie Quevillon and Stephanie Roccia, Grenoble, 14-16 May 2018
- Workshop on multibody charmless B-hadron decays, organised by Eli Ben-Haim and Mat Charles, Paris, 6-7 June 2018
- Workshop on singly and doubly charmed baryons , organised by Emi Kou, Mat Charles, Jean-Marc Richard, Patrick Robbe, Yanxi Zhang, Paris, 26-27 June 2018
- GDR Intensity Frontier Lectures on Vcb, with lectures by Marcello Rotondo and Guilia Ricciardi, Paris, 2-3 July 2018

GDR-InF input for the European Strategy for Particle Physics

The GDR Intensity Frontier

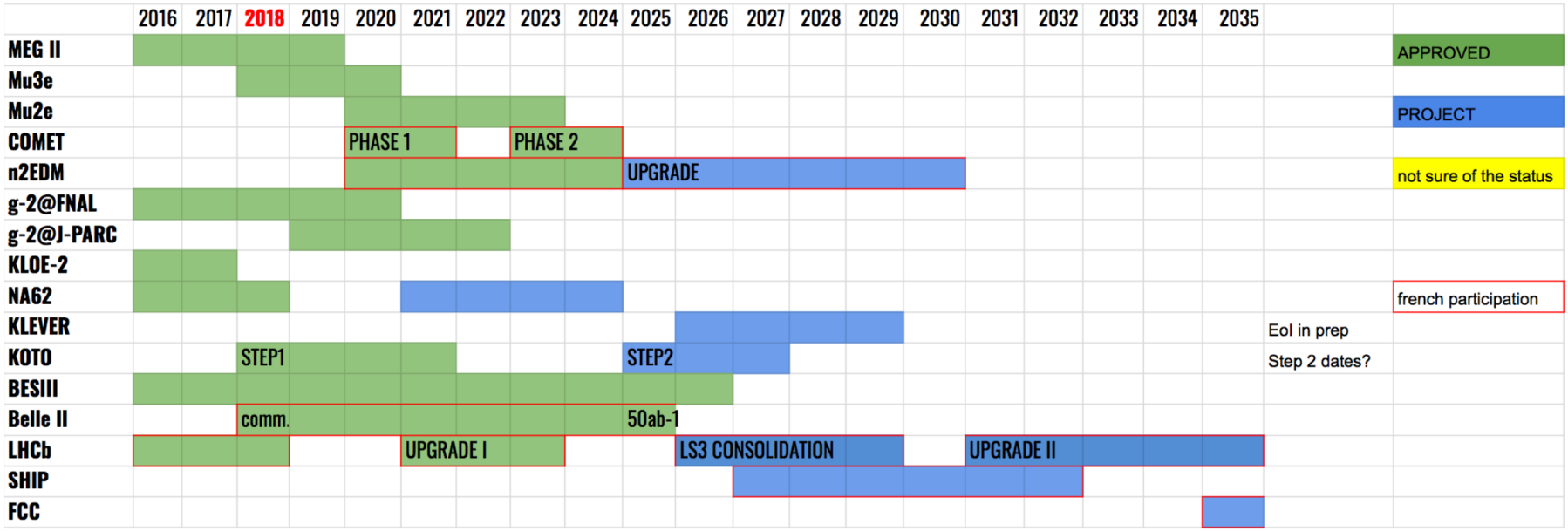
31-08-2018

Research at the intensity frontier allows the detection and interpretation of signs of new physics using large datasets of some of the rarest processes in nature. If new particles are found by direct searches, then indirect tests are needed to study the new physics structure and couplings. If on the other hand no direct evidence for new physics is found in collisions, which has been the case so far at the LHC, higher scales and/or smaller couplings can be probed by experiments at the intensity frontier. Lately the case for the intensity frontier has further been strengthened by several anomalies observed in measurements of rare B decays, the anomalous magnetic moment of the muon and the proton radius.

The GDR-InF, gathering the French community working on the intensity frontier, supports an experimental strategy based on two complementary pillars: large facilities with a wide physics program (LHC, SuperKEKB, HL-LHC, beam dump experiments at SPS, ILC and FCC) and experiments dedicated to specific measurements of crucial observables (EDM, g-2, LFV experiments). This document provides an overview of the experiments in which the GDR-InF physicists are involved, and that we wish to see endorsed by the European Strategy for Particle Physics (ESPP). Members of the GDR-InF currently produce high level physics results with running experiments and perform detector developments to prepare the future ones. Experiments with no involvement in the GDR-InF experimental community, but which are recognized as crucial for the field are also mentioned. Finally, the GDR-InF underlines the interplay [illegible] experiments to be supported as part of the strategy.

link to document submitted on gdrintensityfrontier.in2p3.fr

Experimental timeline for the future



Status as of the 2nd February 2018

Annual workshop 2018

Updates from the working groups:

- Summary of research worked on in France
- Highlights from events over the past year
- Overview of interesting topics in the field (subjective + provocative!)

Overview talks and talks from PhD students and postdocs:

- Overview/highlight talks from well established researchers
- Presentation of latest research
- Important role of postdocs and PhD students in the GDR-InF

Discussion session:

- Requested fill in survey, get a feeling of interests
- Would like to use the GDR as a way of starting new collaborations
- Topics collected, mostly in WG2, might reflect current interests

Round table discussion:

- Structure of working groups, volunteers for convenors
- Ways to promote discussions
- Ideas for future events, original ideas for workshop formats