

NuPECC LRP2010

Outline

Rationale

- Nuclear Physics projects involve setting up large-scale Research Infrastructures
 - Needs
 - Strong science case
 - Strong support of scientific community
 - Strong support of policy makers
 - Coherent action of funding agencies
 - Because they are expensive!
- NP projects have very long lead times
 - Needs
 - Considered planning ahead (Forward Looks, Long Range Plans)

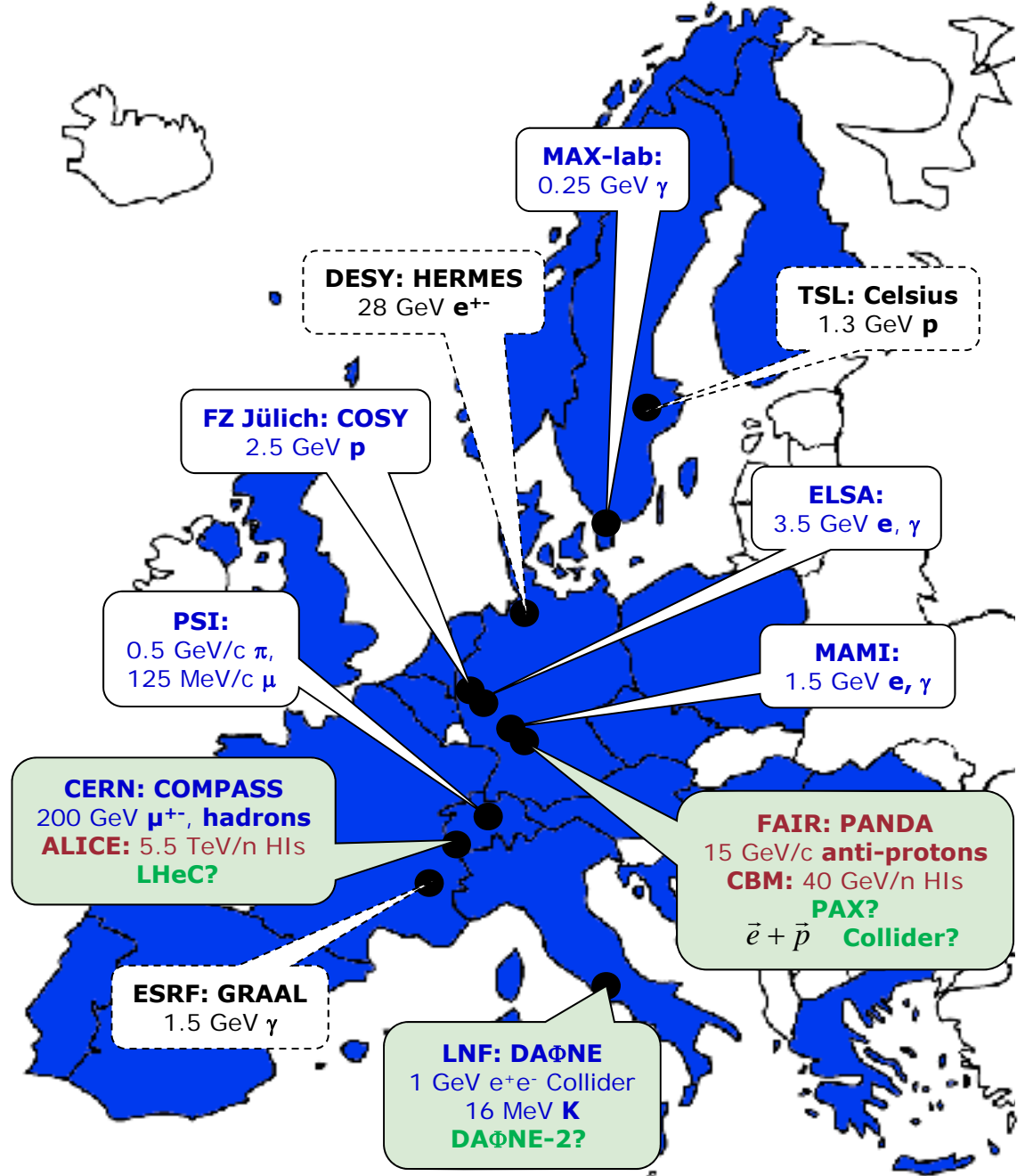
Objectives

- Review status of the field
- Put European Nuclear Physics into the worldwide context
- Issue recommendations to advance
 - The science &
 - Its applications in Europe
- Develop action plan
 - Roadmap for
 - Upgrading existing NP facilities
 - Building new large-scale Research Infrastructures
- Collaborate with
 - IAs: HadronPhysics2 and ENSAR
 - Funding agencies: NuPNET

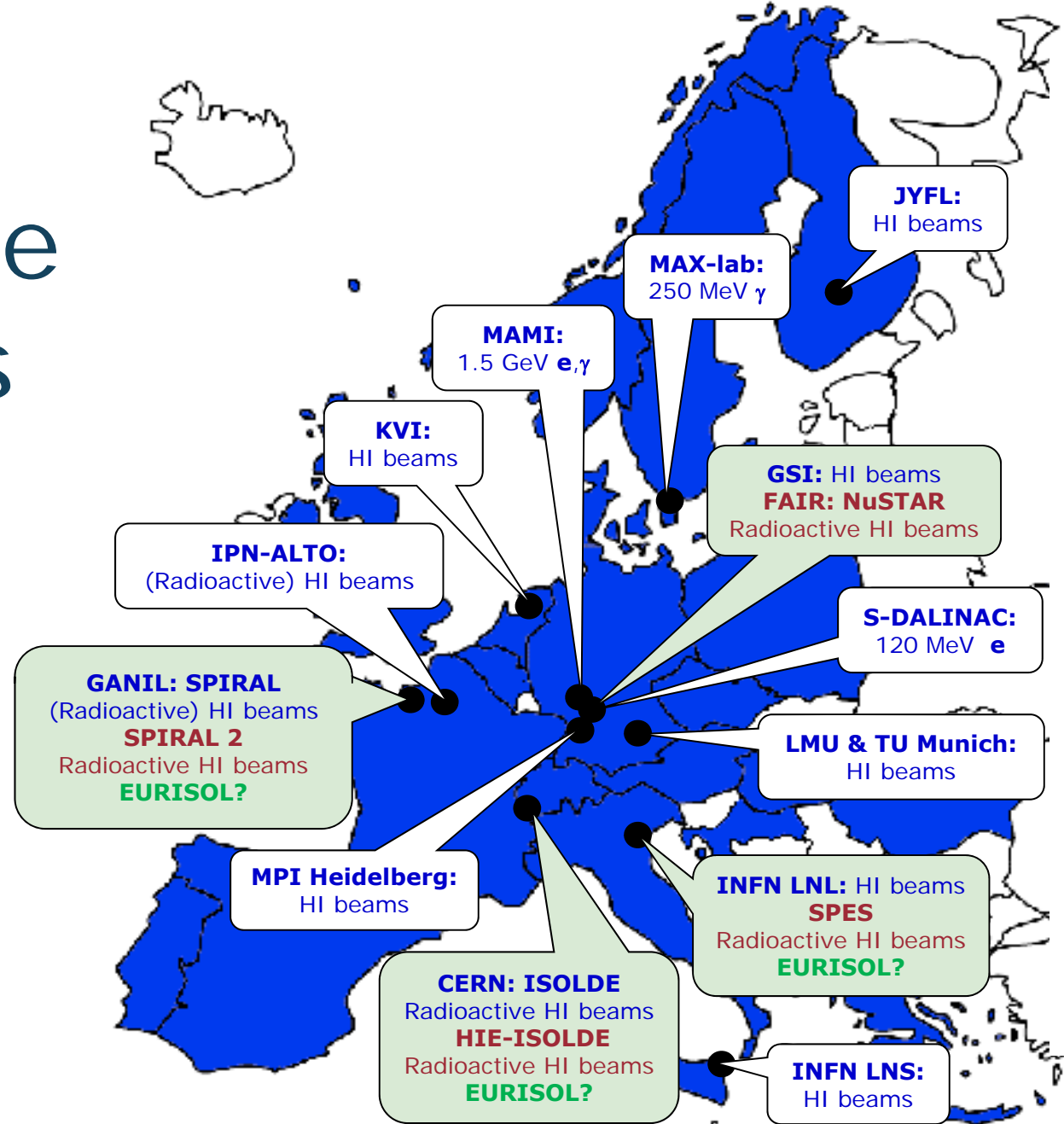
Scientific Issues

- **Nature of visible matter in the universe**
 - Structure of strongly interacting particles (hadrons)
 - Confinement, QCD vacuum
 - Exotic hadronic matter
- **Generation of matter**
 - At very high temperatures shortly after Big Bang
 - At very high densities, e.g. in the core of neutron stars
- **Nuclear properties 300 → 3000 nuclei**
 - Nuclei at their limits of existence
 - Generation of heavy nuclei in cataclysmic cosmic events
 - By use of intense radioactive beams
- **Fundamental Interactions**
 - Matter dominance in Universe
 - Nature of neutrinos
 - (Violation of) Symmetries
- **Applications of nuclear physics for e.g.**
 - Energy generation
 - Nuclear Medicine
 - Homeland Security

Hadron (QCD) Facilities



Nuclear Structure Facilities



Themes

- Themes

- 1) Hadron Structure & Spectroscopy
- 2) Phases of Strongly Interacting Matter
- 3) Nuclear Structure & Dynamics
- 4) Nuclear Astrophysics
- 5) Fundamental Interactions
- 6) Nuclear Physics Tools & Applications

- NuPECC Steering C'ttee

- 1) G. Rosner (Chair)
- 2) J.J. Gaardhøje
- 3) A. Bracco
- 4) P.-H. Heenen
- 5) E. Widmann
- 6) Ph. Chomaz

- NuPECC Liaison

- 1) J. Wambach
- 2) Th. Peitzmann
- 3) M.J.G. Borge
- 4) S. Harissopulos
- 5) K. Jungmann
- 6) E. Nappi

Working Groups

1) Hadron Structure & Spectroscopy

– Convener: U. Wiedner (U Bochum)

- Experts: C. Alexandrou, M. Anselmino, R. Beck, M. Birse, T. Bressani, M. Guidal, T. Hennino, F. Maas, U. Meissner, K. Peters, A. Schaefer, M. Soyeur, A. Szczurek, M. Vanderhaeghen

2) Phases of Strongly Interacting Matter

– Convener: P. Giubellino (INFN Torino)

- Experts: G. Cardella, F. Gulminelli, A. Kugler, J. Nystrand, J.-Y. Ollitrault, M. Petrovici, K. Redlich, P. Senger, R. Snellings, J. Wessels, U. Wiedemann

3) Nuclear Structure & Dynamics

– Convener: R. Julin (JYFL Jyväskylä)

- Experts: N. Alahari, T. Aumann, Y. Blumenfeld, P. Butler, H. Fynbo, A. Gadea, W. Korten, A. Maj, G. Neyens, T. Nilsson, R. Roth, P. Roussel-Chomaz, C. Scheidenberger, A. Vitturi, Dario Vretenar

4) Nuclear Astrophysics

– Convener: B. Fulton (U York)

- Experts: N. Chamel, Z. Fülöp, F. Hammache, M. Heil, J. José, F. de Oliveira, P. Prati, T. Rauscher, S. Romano, K. Sonnabend, C. Vockenhuber, P. Woods

5) Fundamental Interactions

– N. Severijns (KU Leuven)

- Experts: R. Calabrese, G. Drexlin, D. Horvath, K. Kirch, K. Pachuki, F. Piquemal, S. Schönert, R. Timmermans, C. Volpe, O. Zimmer

6) Nuclear Physics Tools & Applications

– Convener: S. Leray (IRFU Saclay)

- Experts: J. Benlliure, A. Boston, M. Durante, S. Gammino, J. G. Camacho, M. Huyse, J. Kucera, P. Moretto, L. Sihver, C. Trautmann

Outline LRP2010

- Recommendations (SC + Liaison + WG-Conveners → NuPECC)
 - Priorities
 - Roadmap (experiment + theory)
- Executive Summary (SC + Liaison + WG-Conveners)
 - Purpose
 - Scientific & societal scope
 - Objectives
 - Summary Themes
 - Summary Research Infrastructures & Networking
- Science Case (WGs)
 - Theme 1 (ca. 20 pages)
 - Theme 2 (ca. 20 pages) ...
- Research Infrastructures (SC + Liaison + Lab. Directors + FP7 Coordinators → early feedback to WGs)
 - Description of existing large-scale facilities (1-2 pages each)
 - Upgrade plans (1-2 pages each)
 - Plans for building new Research Infrastructures (ca. 3-5 pages each)
 - Networking: among facilities, with FP7 IAs & funding agencies (NuPNET)

Timelines

- **NuPECC**
 - Summer/autumn 2009: Working Groups meet
 - 12-13 Oct. 2009: Scoping Workshop @ FIAS, Frankfurt
 - 31 May – 2 June 2010: Town Meeting @ CSIC, Madrid
- **ESF**
 - Aug./Sept. 2009: Outline Forward Look Proposal LRP2010
 - 18 Sept. 2009: Endorsed by Science Advisory Board
 - 1 Oct. 2009: Grant request approved by Governing Council
 - Dec. 2010: Publication of Forward Look LRP2010
- **ESFRI**
 - 2011: NuPECC Roadmap → ESF → ESFRI
- **EU**
 - From 2014: Framework 8 Programme to establish the European Research Area, ERA

Tasks WGs

- Finalise lists of
 - Big questions (cf. LRP2010 grant request)
 - Key issues (cf. LRP2010 grant request)
- Decide upon detailed structure of contribution to LRP2010
 - Review recent achievements and the current state of the art
 - Identify open problems and hot topics in the field
 - Develop medium and long-term strategies to tackle them
 - Optimise interplay between experiment and theory
 - Develop the European and worldwide perspective of the field
 - Formulate recommendations and suggest action plan
(cf. LRP2010 grant request)
- Set up schedule for
 - Telephone & face-to-face meetings
 - Submission of (revised) contributions to SC
 - Involvement of community before town meeting May/June 2010 by e.g.
 - Inviting experts to WG's face-to-face meetings
 - Organising mini-workshops
 - Putting drafts on NuPECC website

WGs' Contributions

- Introduction to the topic (including “big questions”)
- Conceptual framework (including “key issues”)
- State of the art & future directions (exp. & theor.)
 - Sub-topic 1
 - Sub-topic 2
 -
- Future requirements
 - Upgrade/new build of research infrastructures
 - Upgrade/new build of large-scale instrumentation
 - New theory tools
- Conclusions
 - Recommendations
 - Priorities
 - Roadmap

NB: No references

Outline Networking

- Among facilities
 - HadronPhysics2 & ENSAR Research Infrastructures
 - Smaller research infrastructures
 - Future large-scale facilities
 - ESFRI facilities: FAIR, SPIRAL 2, etc.
 - Emerging facilities: EURISOL, EIC, etc.
- With FP7 IAs
 - HadronPhysics2
 - ENSAR
 - SPIRIT?
- With funding agencies
 - NuPNET
 - Use their July 2009 survey of NP resources in Europe
 - Collaborate in developing a vision for Nuclear Physics in Europe

Schedule

Dates	Actions	Deliverables
12-13/10/09	Scoping Workshop @ FIAS, Frankfurt	WGs' final lists of Big Questions, Key Issues & Activities
Oct. '09-Jan. '10	WGs draft Themes' contribution to LRP2010. SC + Liaison + Lab. Directors + FP7 Coordinators draft RIs chapter including networking and provide early feedback to WG-Conveners.	Draft, to SC 15/1/10
Jan./Feb. '10	SC + Liaison + WG-Conveners draft Exec. Summary. SC drafts Recommendations: Priorities & Roadmap	Draft, to NuPECC 1/3/10
12-13/3/10	NuPECC evaluates LRP2010 draft.	List of requested changes
March/Apr. '10	SC + Liaison + WGs revise draft.	Draft, to NuPECC 1/5/10
May '10	NuPECC evaluates revised draft. SC + Liaison + WG-Conveners prepare Town Meeting.	Draft, to European NP community 15/5/10
31/5-2/6/10	Town Meeting @ CISC, Madrid	List of requested changes
June-Oct. '10	SC + Liaison + WGs revise Draft LRP2010.	Draft, to NuPECC 25/9/10
8-9/10/10	NuPECC evaluates revised draft.	List of requested changes
Oct.-Dec. '10	SC + Liaison + WGs finalise LRP2010.	LRP2010 , published Dec. 2010 .

Thanks very much
for your attention