

Helmholtz Allianz 'Cosmic Matter in the Laboratory' ExtreMe Matter Institute

Status and Perspectives

pbm, Sep. 2011

Original ALLIANCE Goals

establish the "**E**xtr**eM**e **M**atter **I**nstitute", *EMMI*, as a **Think Tank for extreme matter research**

aiming at:

- interdisciplinary scientific programs of highest quality
- strong promotion of young researchers through a postdoctoral and structured training program
- new network among two Helmholtz centers and ten top national and international laboratories and universities
- support and preparation for FAIR

EMMI Partners

- GSI Helmholtzzentrum für Schwerionenforschung, Darmstadt (coordinating Helmholtz Center)
- Forschungszentrum Jülich
- Technische Universität Darmstadt
- Universität Frankfurt a.M.
- Universität Heidelberg
- Universität Münster
- Max-Planck-Institut für Kernphysik, Heidelberg
- FIAS Frankfurt Institute for Advanced Studies
- Université Marie et Pierre Curie (Paris VI) Paris
- Lawrence Berkeley National Laboratory (LBNL), USA
- Joint Institute for Nuclear Astrophysics JINA, USA
- University of Tokyo, Japan
- RIKEN, Japan

EMMI Associate Partners and Members

In addition to the partner institutions, the Alliance benefits from the expertise of internationally renowned scientists who are closely linked to it as Associated Partners. In 2010 the Alliance had 30 Associated Partners. In total, more than 350 scientists (including students) at the partner institutions perform research on the subjects of the Alliance.

EMMI Management

- Peter Braun-Munzinger, EMMI Scientific Director
- Carlo Ewerz, EMMI Scientific Coordinator
- Heidrun Bojahr, EMMI Administrator

- 4 (3 FTE) Assistant and Technical Staff

EMMI Scientific Council

- Johannes P. Wessels (Chair of SC), U Münster
- Peter Braun-Munzinger (EMMI Scientific Director), EMMI
- Horst Stöcker (GSI Scientific Director, ex officio), GSI
- Karlheinz Langanke, GSI
- Paul Gibbon, FZ Jülich
- Jochen Wambach, TU Darmstadt
- Joachim Stroth, U Frankfurt
- Johanna Stachel, U Heidelberg
- Klaus Blaum, MPI für Kernphysik, Heidelberg
- Marcus Bleicher, FIAS
- Paul Indelicato, U Paris
- James Symons, LBNL
- Ani Aprahamian, JINA
- Takaharu Otsuka, U Tokyo
- Tohru Motobayashi, RIKEN
- Krzysztof Redlich (EMMI Associated Partner), U Wroclaw
- Gerd Röpke (EMMI Associated Partner), U Rostock

EMMI Program Advisory Committee

Quark-Gluon Plasma Physics:

- Paolo Giubellino, INFN Torino
- Larry McLerran, Brookhaven National Laboratory

Neutron Matter Physics:

- Isao Tanihata, Osaka University
- Friedrich-Karl Thielemann, University of Basel

Plasma Physics:

- Francois Amiranoff, Laboratoire pour l'Utilisation des Lasers Intenses LULI, Paris
- Thomas Cowan, Helmholtz-Zentrum Dresden-Rossendorf

Atomic Physics:

- Robert Dunford, Argonne National Laboratory
- Jörg Schmiedmayer, Atominstitut der österreichischen Universitäten, TU Wien

EMMI Personnel and Recruitment

- 16 (of 18) tenure/tenure track positions filled
- the remaining positions are in final stages of negotiation
- since Oct. 2010 all four EMMI Fellow positions at GSI/EMMI are filled
- 151 PhD students in 2010
- structured PhD training via associated grad.schools
- 116 postdocs in 2010

EMMI Collaborations and Connections

- MoU for scientific collaboration with
- Joint Institute for High Temperatures (JIHT) of the Russian Academy of Sciences in 2009
- MoU for scientific collaboration with Helmholtz Institute Jena in 2010
- MoU for scientific collaboration with Polish Academy of Arts and Sciences in 2010
- Fast (10 GB/s) internet link between GSI/EMMI and local German universities

New EMMI Program: Visiting Professor Positions

- Possibility to invite internationally renowned scientists for a period of up to one year
- Three EMMI visiting professors in 2009, five in 2010

EMMI Scientific Output

- More than 600 publications in refereed journals
- 24 international and multidisciplinary workshops

Additional Value of Alliance for Helmholtz Center(s) and Partners

- Close strategic links between Helmholtz centers and national and international partners
- New interdisciplinary approach to explore extreme matter across several disciplines
- HGF funded Alliance positions are secured by the partners beyond the lifetime of the Alliance
- Exploration of new scientific opportunities through workshops and scientific programs
- Joint programs to support young scientists

EMMI Perspectives

- New EMMI building at GSI as center and focus
- World-wide unique interdisciplinary center for extreme matter research
- Strong networking and collaboration among partners
- Exploration of new scientific opportunities through EMMI workshops and programs

EMMI Perspectives

- Unique opportunities in quark matter research with strong synergies between LHC-ALICE and
- FAIR-HADES-CBM
- Coordinated neutron matter research with new tools between RIKEN, MSU, and GSI in preparation for FAIR start
- Novel tools for plasma physics at GSI and later XFEL and FAIR

EMMI Perspectives

- Ultra-cold gases as model systems for condensed matter and QCD studies
- Atomic physics with highly charged ions at GSI, SPIRAL, and partner laboratories with new tools and precision traps in preparation of FAIR

EMMI Beyond 2014

- Longterm intellectual think tank for extreme matter research
- Strong collaboration among EMMI partners in the four core research areas
- Continuation of EMMI workshops and physics programs on extreme matter research
- Support for the four EMMI Fellow teams

EMMI Beyond 2014

- Continued coordination by EMMI core team
- Continuation of Visiting Professor program including seminar and lecture series
- Scientist in Residence program
- Support for occasional (about once per year) Rapid Reaction Task Force on matters of urgent and common interest

EMMI Beyond 2014

- GSI has added EMMI into the strategic planning for POFIII (2015 – 2019)
- This requires a corresponding increase of the center's base finances
- The financial needs for EMMI in POFIII are between 2.5 and 3 Million Euro/year
- To continue operation of EMMI between the end of the Alliance (March 2014) and the beginning of POFIII needs about 2 Million Euros
- We believe that all necessary structures and activities are in place for a successful integration of EMMI in POFIII