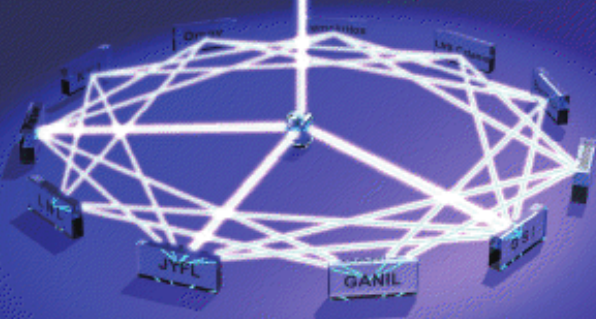


ENSAR

HIGH INTENSITY
STABLE ION BEAMS
in EUROPE

ECOS

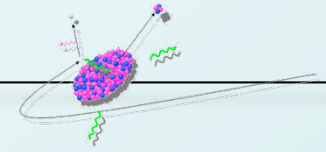


ECOS: European COllaboration on Stable ion beams

NuPECC



NuPECC is an Expert Committee of the European Science Foundation



ENSAR-ECOS Coordination Committee meeting

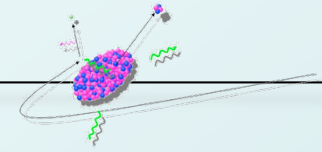
task 2

synergies in the field of SHE research

Dieter Ackermann
GSI

Helmholtzzentrum für Schwerionenforschung GmbH

Kraków, August 30th 2011



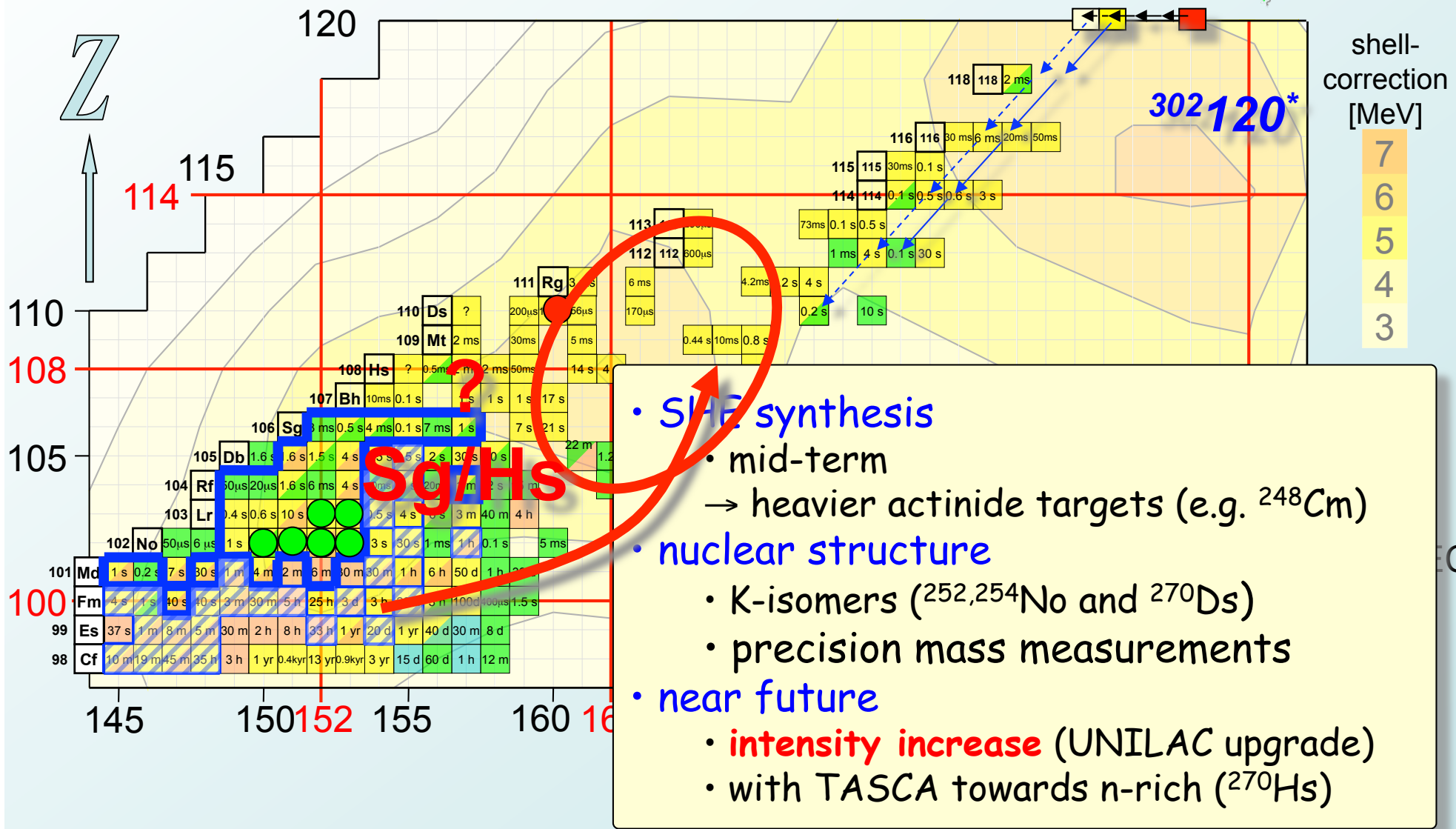
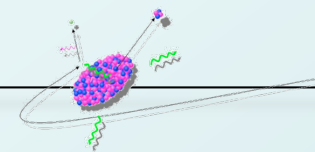
ECOS Task 2 has the objective to promote **synergies in the field of Super-Heavy Element (SHE) research**, described as follows:

*"For this task ECOS is aiming for **bringing together the groups with research activities on SHE using high-intensity ion beams** for an exchange of new ideas and techniques related to the use of very high intensity stable beams. In particular, Task 2 will propose an **optimisation of resources** (beam time, target technology, detectors) in the field of SHE research **among TNA facilities**."*

The **ENSAR-ECOS** Workshop on **FUture Super-Heavy Element Strategy – FUSHE 2012** is one very important milestone in this process. It will provide a **forum for the SHE community to discuss and define the future strategy to reach** the common goal – the establishment and investigation of the region of spherical shell-stabilised super-heavy nuclei – the so called **"Island of Stability"**.

Summary and outlook

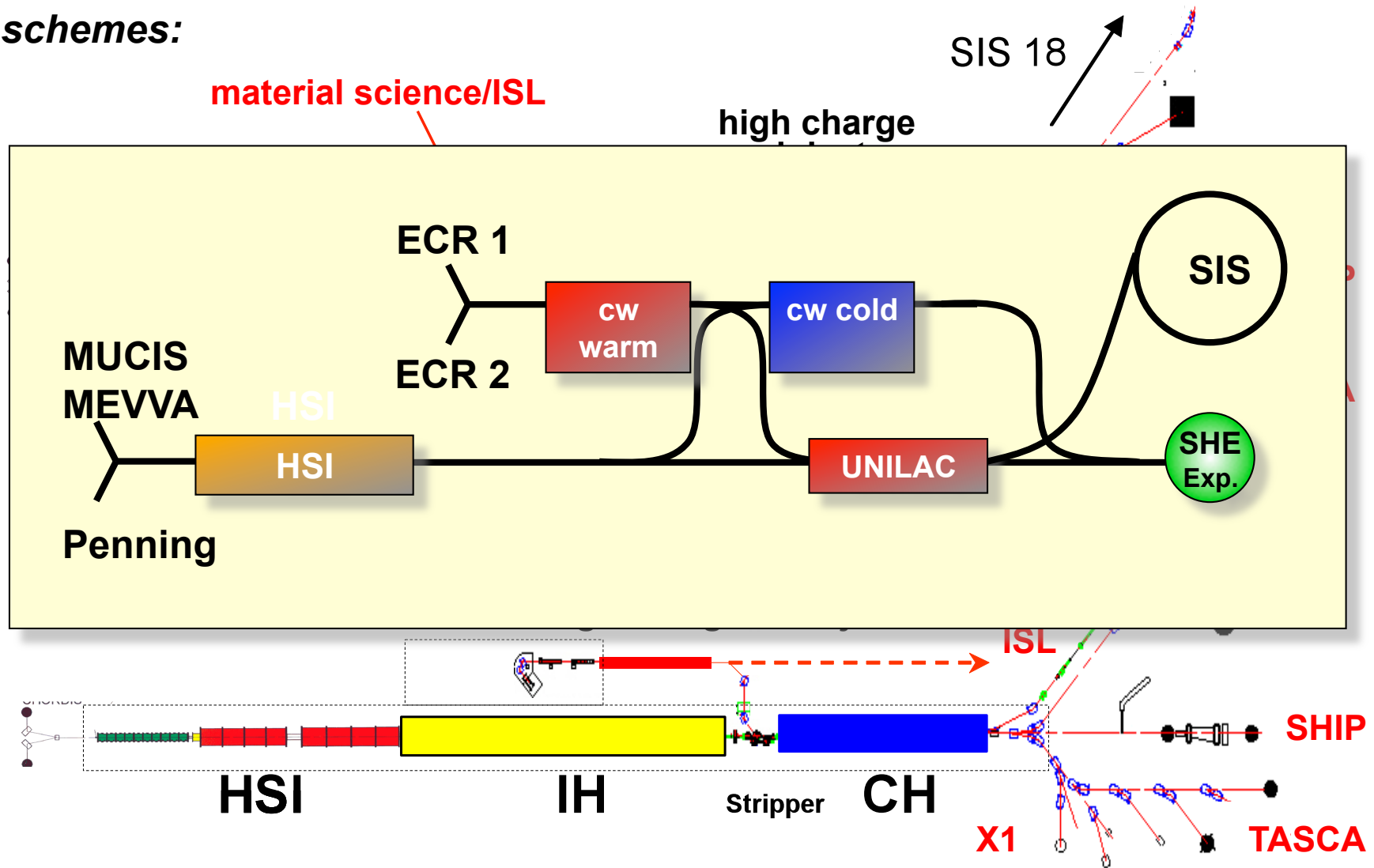
- Present and Near Future



SHE Synthesis and Nuclear Structure of SHE

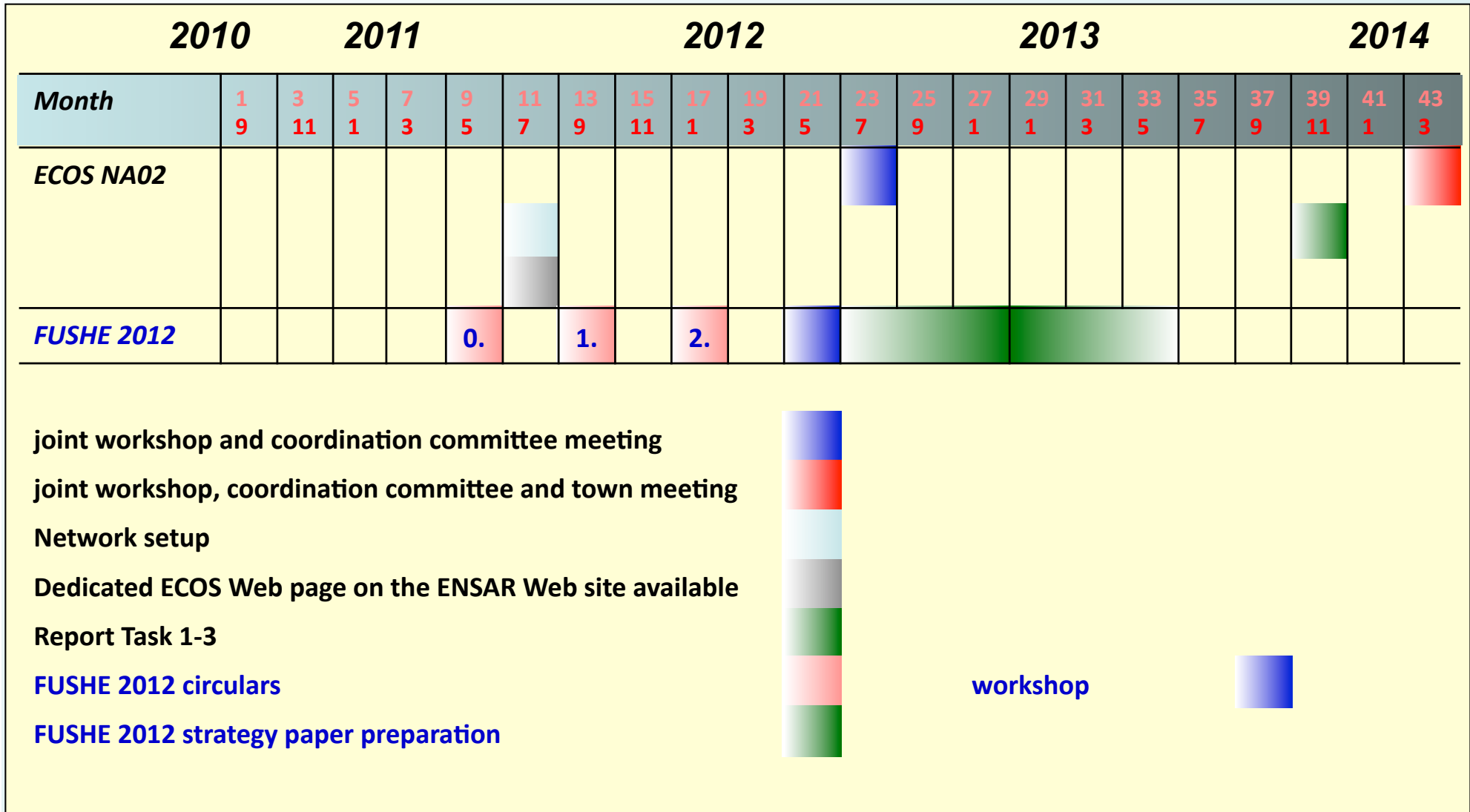
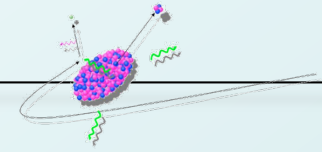
- Roadmap/Long Term

Possible GSI
acc. schemes:



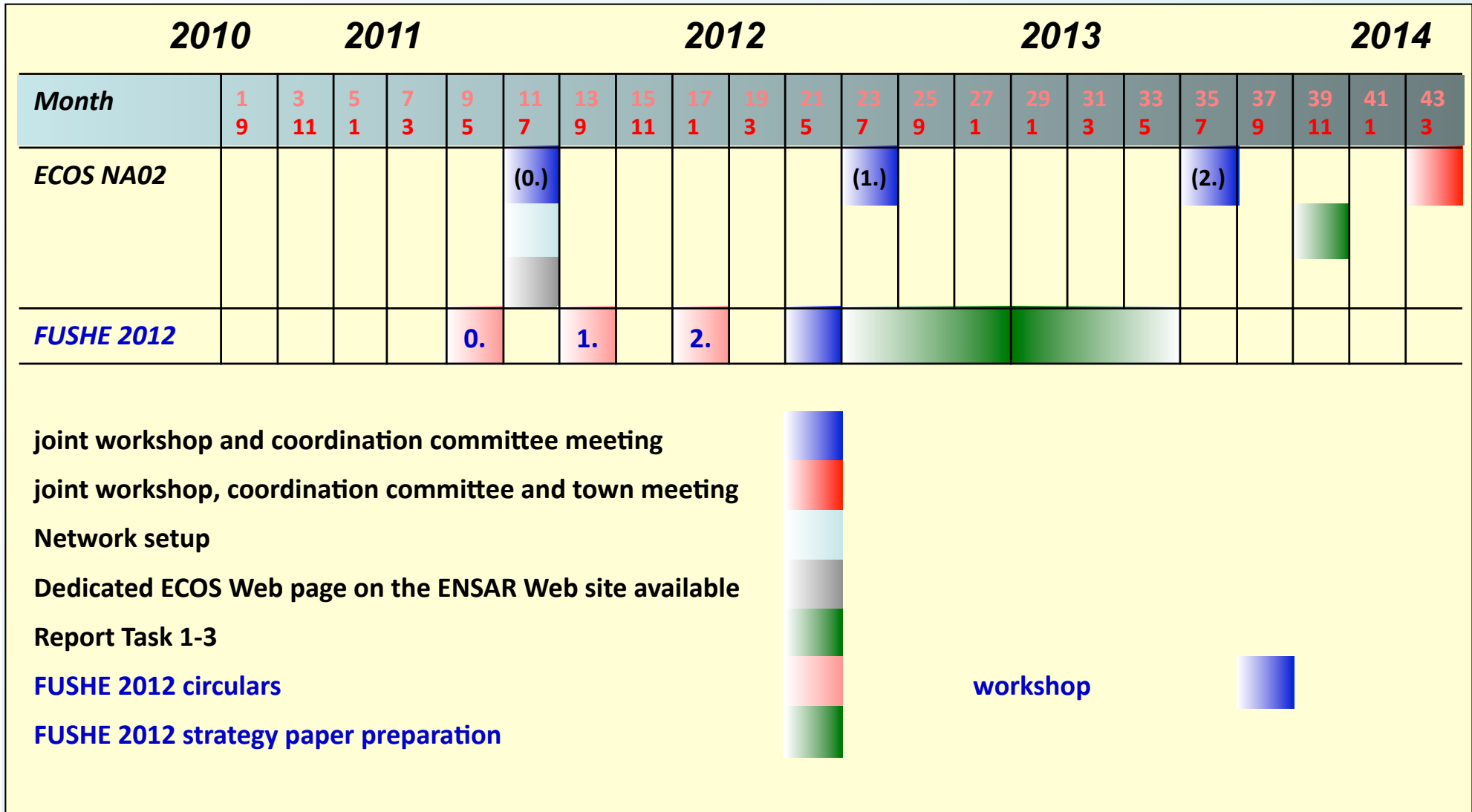
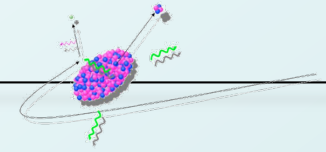
ENSAR-ECOS NA

- timeline



ENSAR-ECOS NA

- timeline



FUSHE 2012 - Topics and Goal



- Experiment
- Theory
- Instrumentation

Goal:

Discuss and define the (near and far) future strategy for the field of SHE research

Experiment

- Z- and A identification of the isotopes produced in ^{48}Ca -induced reactions on actinide targets
- Single particle trends towards the gap of the spherical SHE
- Ground state properties (e.g. masses)
- Decay properties (fission barriers, lifetimes) of SHE
- Chemical properties
- Reaction mechanism
- Collective properties/in beam spectroscopy

- Experiment
- Theory
- Instrumentation

Goal:

Discuss and define the (near and far) future strategy for the field of SHE research

Theory

- Spherical and deformed shell gaps, density profiles, stabilization mechanisms (shell, vibrational etc.).
- Structure of ground and low-lying excited states of SHN: energies, spins, parities, transition strengths, isomerism
- Evolution of ground state shapes and fission barriers as function of Z and A, and limits of the region of SHE
- Excitation energy dependence of fission barriers
- Evolution of di-nuclear systems: contact to capture, fusion-fission, deep-inelastic collision etc.
- Energy transfer, dissipation-fluctuation dynamics in nuclear reactions.
- A review of the relevant models and guidance for future experiments.
- SHE quantum chemistry
- Astrophysical relevance for SHE

- Experiment
- Theory
- Instrumentation

Goal:

Discuss and define the (near and far) future strategy for the field of SHE research

Instrumentation

- High intensity stable beam accelerator
- High current/low energy target development
- New separators (S3, M/Q- or other mass selection/spectroscopy)
- Detector development
- Inbeam spectroscopy/target (gammas, electrons,...)
- Decay spectroscopy/after separation (ERs, alphas, gammas, electrons, X-rays)
- Electronics (digital, pulse shape analysis,...)
- Ion traps
- Laser spectroscopy
- Chemistry instrumentation (gas-jet transport system; ion-exchange, solvent extraction, electro-chemistry apparatuses; gas-chemistry apparatuses; chemistry apparatus coupled to recoil separators, detectors coupled to chemistry apparatus)



Workshop Structure

The workshop will be organised in **7 x ½-day sessions** (adjusted to accommodate the final list of topics) with a strong emphasis on discussions:

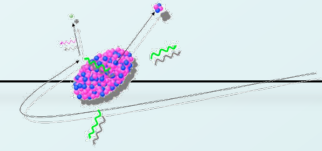
- The sessions will be organised with a combination of **invited talks followed by a topical discussion**. There will be no call for contributed talks. However, (short) contributions will be encouraged for the topical discussion.
- The workshop will be guided by a number of **convenors** (3) and **discussion leaders** for each session
 - The convenors will produce a **paper for their topic** from
 - Summary documents produced by the speakers beforehand
 - Summary and synthesis of the discussion
 - The Chair and co-chair (+OC volunteers) will **prepare a recommendation paper (RP)** from the convenor reports
 - The AC and OC will correct and comment on the RP
 - **The RP will finally be published on the FUSHE and ENSAR/ECOS websites**



Sessions

- The **three main categories** will be combined under various topics such as nuclear structure or synthesis, which will be wrapped up in a final discussion for each **“theme”**.
- The “themes” should, where possible, consist of contributions from the three main categories.
- The sessions will be guided by **discussion leaders** who will **extract strategic ideas, milestones** etc.
- The outcome of the various sessions will be put together in **a final strategy paper** representing the basis for the **common strategy of the SHE community** brought together in the workshop.

FUSHE 2012 - Venue



The **Conference&Sports Hotel Erbismühle** is located in a nice valley, the *Weital*, in the *Taunus hills* about 50 km north of Frankfurt (50 km to Frankfurt main station and 55 km to Frankfurt airport) close to the *village Weilrod* in the centre of Germany.

72 rooms €90 (€60 double occupation) + interesting food option

The *Taunus hills* have formed the northern border of the Roman Empire and traces of it can still be visited today like the rebuilt Roman Castle *Saalburg* together with a few meters of the *limes*, the Roman border installations and defence line against the barbarians north of it...

FUSHE 2012 - Organising Committee



D. Ackermann (chair – GSI)
D. Boilley (co-chair – GANIL)
Ch. Stodel (scientific secretary – GANIL)
B. Avez (CENBG)
M. Block (GSI)
P. Greenlees (JYFL)
K. Hauschild (CSNSM)
D. Jacquet (IPNO)
K. Jadambaa (GSI)
E. Litvinova (GSI)
R. Lozeva (IPHC)
B. Sulignano (IRFU)

FUSHE 2012 - Advisory Committee



M. Bender	CENBG, Bordeaux, France	France	6
J.P. Delaroche	CEA, Bruyères le Chatel, France	Germany	4
A. Drouart	IRFU, Saclay, France	Japan	3
J. Dudek	IPHC, Strasbourg, France	Finland	2
K. Eberhard	U. Mainz, Germany	Poland	2
H. Haba	RIKEN, Wako, Japan	U.S.A	2
P.H. Heenen	U. Brussels, Belgium	Belgium	1
R.-D. Herzberg	U. Liverpool, U.K.	Russia	1
F.P. Heßberger	GSI, Darmstadt, Germany	U.K.	1
T. Khoo	ANL, Argonne, U.S.A .	Switzerland	1
H. Koura	JAEA, Tokai, Japan		
M. Leino	U. Jyväskylä, Finland	Total	23
K. Morita	RIKEN, Wako, Japan		
W. Nazarewicz	U. Knoxville, U.S.A.		
V. Pershina	GSI, Darmstadt, Germany		
H. Savajols	GANIL, Caen, France	Experiment	14
A. Sobiczewski	U. Warsaw, Poland	Theory	9
Ch. Theisen	IRFU, Saclay, France		
A. Türler	PSI, Villigen and U. Bern, Switzerland		
J. Uusitalo	U. Jyväskylä, Finland		
A. Wieloch	U. Cracow, Poland		
A. Yakushev	GSI, Darmstadt, Germany		
V. Zagrebaev	JINR-FLNR, Dubna, Russia		

FUSHE 2012 - Contact



Dieter Ackermann (Chair):

D.Ackermann@gsi.de

David Boilley (Co-chair):

boilley@ganil.fr

Christelle Stodel (Scientific secretary):

christelle.stodel@ganil.fr

Secretaries:

Ms. Siglind Raiß:

s.raiss@gsi.de

Tel.: +49-6159-71-2412

Ms. Tatjana Litvinova:

t.litvinova@gsi.de

Tel.: +49-6159-71-2127

Fax: +49-6159-71-2902.

Workshop email address:

fushe2012@ganil.fr

Webpage:

<http://www.ensarfp7.eu/workshops/fushe2012/>

FUSHE 2012 - Budget



ECOS NA02 budget

		BUDGET					
		Personnel	Subcontracting	Travel	Other Direct Costs	Indirect costs	Total
1	GANIL			13.084		7.850	20.934
2	GSI			4.000	20.000	0	24.000
3	INFN			13.084		7.850	20.934
4	JYU			13.084		7.850	20.934
5	RUG						
6	CERN						
7	CNRS	6.132		8.750	8.750	14.179	37.811
8	TUW						
9	ULB						
10	KULeuven						
11	INRNE-BAS						
12	RBI						
13	NPI						
14	CEA						
15	TUD						
16	NCSR						
17	ATOMKI-HAS						
18	ECT*						
19	UWAR			6.542		3.925	10.467
20	IFJ PAN			6.542		3.925	10.467
22	FFCUL						
23	IFIN-HH						
24	USC						
25	CIEMAT						
26	UCM						
27	PSI						
28	UNIBAS						
29	UNIMAN						
30	JOGU Mainz						
TOTAL		6.132	0	65.086	28.750	45.581	145.549

341.56

REQUEST					
Personnel	Subcontracting	Travel	Other Direct Costs	Indirect costs	Total
		13.084		916	14.000
		4.000	20.000	-	24.000
		13.084		916	14.000
		13.084		916	14.000
		13.084	13.084	1.832	28.000
		6.542		458	7.000
		6.542		458	7.000
0	0	69.420	33.084	5.495	107.999

Additional budget request

IN2P3 **k€ 5** students support (Christelle Stodel, Radomira Lozeva)

HIM **k€ 2-5** (Michael Block)

Preliminary Cost Estimate FUSHE 2012

participants support **k€ 5-?**

food, coffee breaks ... **k€ 7,5**

logistics etc. **k€ 3-4**

Total **k€ 15-?**

FUSHE 2012 - Poster



Erbismühle - Weilrod, Germany - May 13th - 16th 2012

FUSHE2012

**ENSAR-ECOS
Workshop on Future
Super-Heavy
Element Strategy**

**EXPERIMENT
THEORY
INSTRUMENTATION**

INTERNATIONAL ADVISORY COMMITTEE

M. Bender (CENBG)
J.P. Delaroche (DAM-CEA)
A. Drouart (IRFU-CEA)
J. Dudek (IPHC)
K. Eberhard (U. Mainz)
H. Haba (RIKEN)
P.H. Heenen (U. Brussels)
R.-D. Herzberg (U. Liverpool)
F.P. Heßberger (GSI)
T. Khoo (ANL)
H. Koura (JAEA)
M. Leino (U. Jyväskylä)
K. Morita (RIKEN)
W. Nazarewicz (U. Knoxville)
V. Pershina (GSI)
H. Savajols (GANIL)
A. Sobierzewski (U. Warsaw)
Ch. Theisen (IRFU)
A. Türler (PSI/U. Bern)
J. Uusitalo (U. Jyväskylä)
A. Wieloch (U. Cracow)
A. Yakushev (GSI)
V. Zagrebaev (JINR-FLNR)

FUSHE2012 will be a working meeting to discuss and develop the (near and far) future for the field of Super-Heavy Elements.

ORGANIZING COMMITTEE

D. Ackermann (chair – GSI)
D. Boilley (co-chair – GANIL)
C. Stodel (scientific secretary – GANIL)
B. Avez (CENBG)
M. Block (GSI)
P. Greenlees (JYFL)
K. Hauschild (CSNSM)
D. Jacquet (IPNO)
K. Jadambaa (GSI)
E. Litvinova (GSI)
R. Lozeva (IPHC)
B. Sulignano (IRFU-CEA)

CONTACT: fushe2012@ganil.fr WEB: <http://www.ensarp7.eu/workshops/fushe2012/>

Dieter Ackermann



steering committee meeting

Kraków, August 30th 2011

