Helmholtz VI-503 Annual Meeting, Elba

B. Foster
Uni-HH/DESY/JAI-Oxford

Introduction

Peer Review
- Scientific Advisory Committee
- Helmholtz Mid-term Review

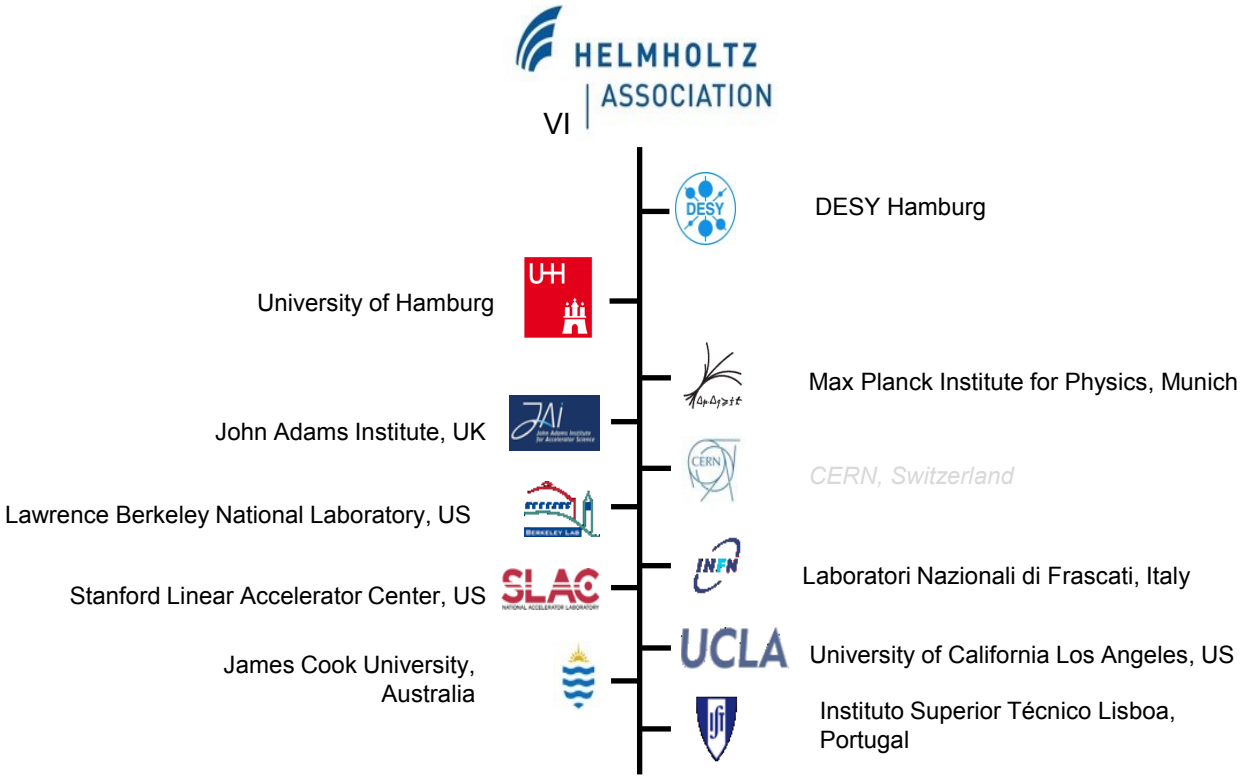
Future work

Agenda

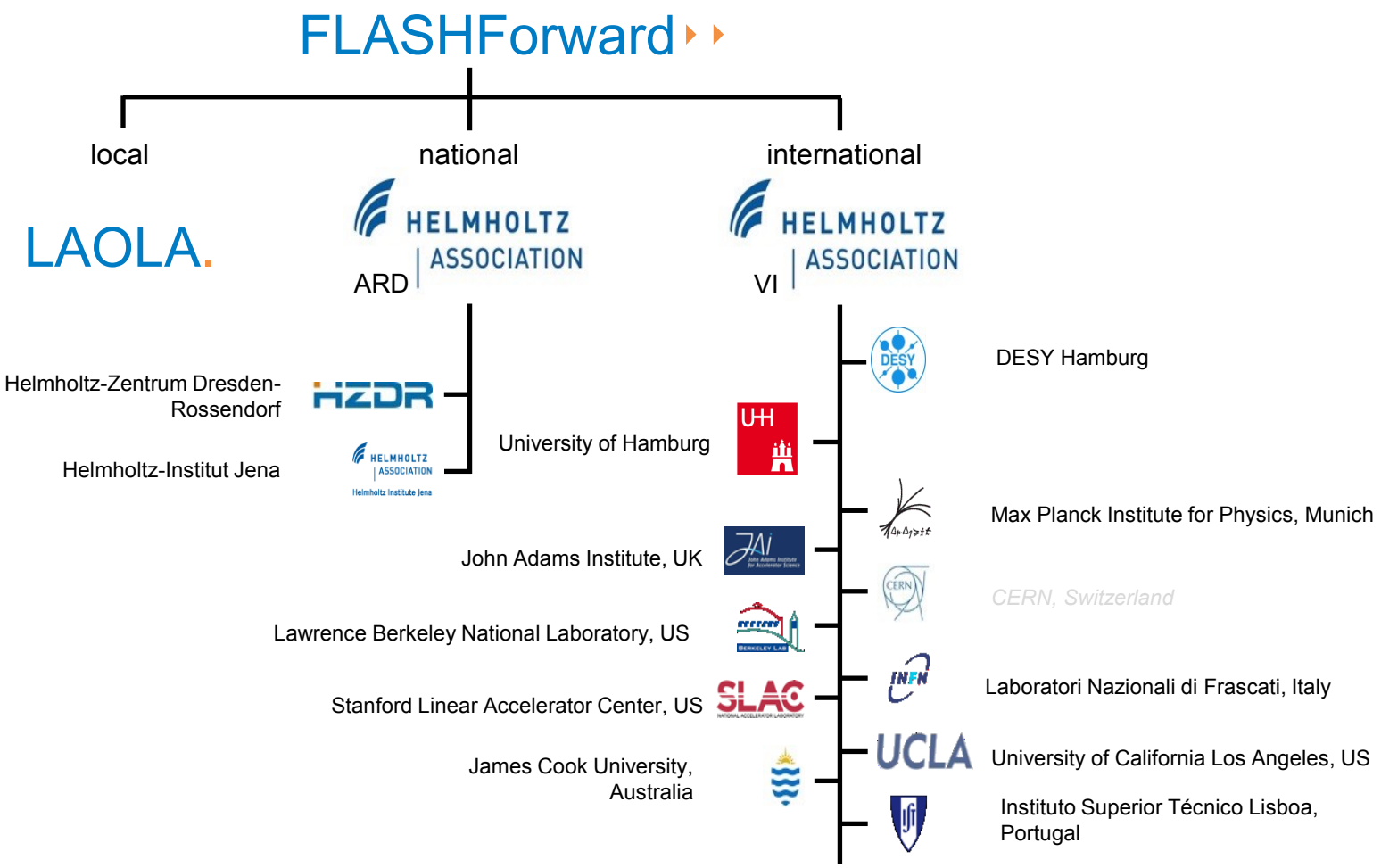
VI Mission Statement

- “A Helmholtz Virtual Institute brings together the key competencies of one or more Helmholtz Centres with those of one or more universities to create a centre of excellence of international standing. This serves to create a new quality of cooperation strengthening scientific excellence and increasing international competitiveness. Other national or international partners may be involved as associated partners.”

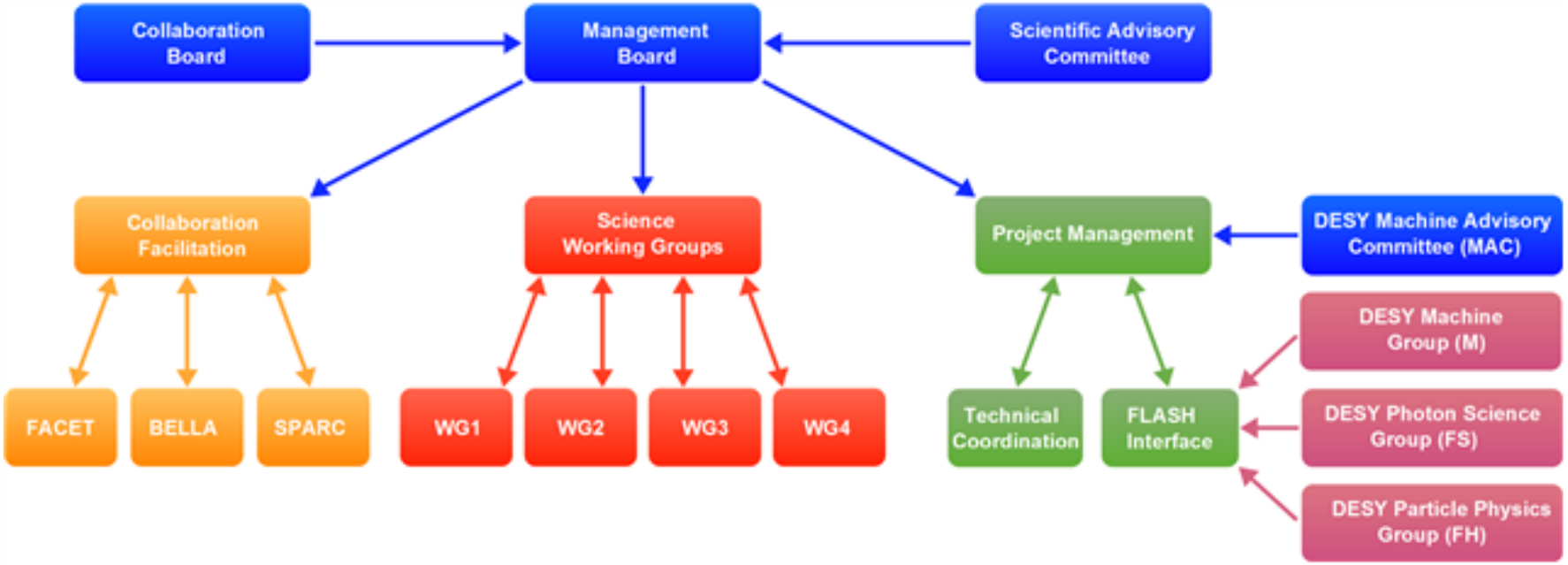
The VI-503 collaboration network



The FLASHforward collaboration network



Virtual Institute on Plasma Wakefield Acceleration Structure



Advice & Oversight

Scientific Advisory Committee set up early this year:

Chair: I. Ben-Zvi (Brookhaven National Lab., USA)
Brigitte Cros (Saclay, France)
Stefan Karsch (Max Planck Institute, Munich)
Phillipe Piot (Northern Illinois University, USA)
Mitsuhiro Yoshida (KEK, Japan)

Advice & Oversight

First meeting of SAC in April @ DESY

Charge to the SAC

- to investigate the extent to which the VI is fulfilling the aims set out by the Helmholtz Association as set out in Annex I below and to make suggestions to improve its efficacy;
- to evaluate the effectiveness and promise of the scientific programmes and priorities of the VI;
- to give advice on the management and implementation of the projects carried out in the context of the VI;
- to make other suggestions in the general area of plasma-wave acceleration that may be relevant to the work of the VI.

Annex 1

“Helmholtz Virtual Institutes provide a distinct benefit in preparing the way for larger strategic research projects by establishing new research partnerships. thereby strengthening the position of universities in the German scientific system. A further aim of the funding programme is to generate new collaboration with leading international partner institutions and the industry.”

SAC Closeout Preamble

- The SAC heard presentations by members of the Helmholtz Virtual Institute and took a tour of the construction site of FLASHForward (FF).
- The high quality of the presentations was noted by the SAC members.
- The SAC was impressed by the large number of young people, students and post-docs, involved in the SAC and their high level of enthusiasm.

SAC Closeout
Conclusions (selected)

- The SAC concludes that the VI is fulfilling the aims set out by the Helmholtz Association.
- The effectiveness and promise of the scientific programmes and priorities of the VI:
  - FLASHForward will be one of the world's premier facilities in the field of PWFA, complementing existing facilities like FACET, ATF and KEK both topically and temporally.

SAC Closeout
Conclusions (selected)

- Contd.
  - It capitalizes on a superconducting linac combined to an RF gun with superior control on beam properties and stability.
  - It combines expertise from the leading groups in Europe and US
  - The SAC feels that these are adequate prerequisites for success

SAC Closeout
Conclusions (selected)

- to give advice on the management and implementation of the projects carried out in the context of the VI

  – In view of the accumulated delay, prioritization of scientific programme and methods should be considered.
  – Dependence on FACET and FLASH-2 availability should be critically assessed and aims/schedule adjusted if necessary.
  – State more clearly the grand future goals – e.g. high-repetition rate operation
  – Consider developing FLASHForward into a user facility in the future

Members of the review committee
Mid-term review of the Helmholtz Virtual Institutes
15 June – 19 June 2015 in Berlin

Chair of the commission: Prof. Dr. Detlev Ganten, President, World Health Summit, Chairman of the Foundation Board, Charité Foundation

Cross-reviewer: Prof. Dr. Martin Stutzmann, Walter Schottky Institut und Physik-Department, Technische Universität München

Cross-reviewer: PD Dr. Hedi Oberhänsli, Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung

Monday, 15.06.2015: Review of the Virtual Institutes in the research fields „Matter" and „Earth and Environment"

Research field	Number of proposal	Titel	Peer reviewer (experts of the relevant field)	Peer reviewer (experts of the relevant field)
Matter	VH-VI-503	Plasma wakefield acceleration of highly relativistic electrons with FLASH	**Prof. Dr. Edda Gschwendtner** CERN Edda.Gschwendtner@cern.ch	**Prof. Dr. Toshiki Tajima** Ludwig-Maximilians-University, Faculty of Physics 85748 Garching ttajima@uci.edu
	VH-VI-521	New states of matter and their excitations	**Prof. Dr. Silke Bühler-Paschen** Technische Universität Wien, Institut für Festkörperphysik Wiedner Hauptstraße 8-10, 1040 Wien, Österreich silke.buehler-paschen@tuwien.ac.at	**Prof. Dr. Gertrud Zwicknagl** Institut für Mathematische Physik TU Braunschweig Mendelssohnstr. 3 38106 Braunschweig g.zwicknagl@tu-bs.de
Earth and Environment	VH-VI-527	Dead Sea Research Venue - DESERVE	**Dr. Hans Kupfersberger** Wasser Ressourcen Management JOANNEUM RESEARCH Forschungsgesellschaft mbH 8010 Graz/Austria hans.kupfersberger@joanneum.at	**Prof. Dr. Maria Carmen Llasat** Departament d'Astronomia i Meteorologia Facultat de Física, Universitat de Barcelona Martí i Franqués 1, planta 7 08028 - Barcelona carmell@am.ub.es
	VH-VI-500	Biological timing in a changing marine environment: Clocks and rhythms in polar pelagic organisms	**Prof. Dr. Martha Merrow** Ludwig-Maximilian-University Munich Medical Faculty, Institute of Medical Psychology Goethestr. 31/I, D-80336 München merrow@lmu.de	**Dr. Melody Clark** British Antarctic Survey, Madingley Road, High Cross, Cambridge, UK E-Mail: mscl@bas.ac.uk

Presentations in Open Session

Introduction - BF

Scientific Overview – Jens Osterhoff (DESY)

Selected Highlights from Young Scientists:

- Simulation of Plasma Wave Acceleration – Timon Mehrling (DESY)
- Temporal Beam Diagnostics – Charlotte Palmer (DESY)
- Plasma Cells – Jan-Hendrik Erbe (University of Hamburg)

Sustainability & Outlook – Eckhard Elsen (DESY)

Simon Hooker (JAI) also present.

Conclusions (selected)

The scientific quality and originality are rated as 'very high': several examples of innovative techniques (e.g. plasma target technology, tailored plasma-density profile, plasma and beam diagnostics...) and new SW tools and simulations (e.g. HiPACE, start-to-end simulation results...) underline this.

The conceptual design of the FLASHForward facility, one of the major interim results of the VI, is internationally highly appreciated.

1. *Networking of the Helmholtz centre with **university partners** (including associated partners).*
   The VI has shown that there are strong collaborations between the VI and several institutes, especially in the field of simulations and diagnostics: e.g. with University of Hamburg, Strathclyde, Townsville, JAI, IST Lisbon.

   However, we recommend that the VI establishes closer networking with other institutes and the wider community in order to profit from their expertise and to foster knowledge exchange.

2. Cooperation with **international partners**?
   The cooperation with international partners such as LBNL and SLAC is very good.

   We would encourage the VI to reach further out for new international community (e.g. ICUIL, ELI) to promote and cross-fertilize innovative technologies. It would be also desirable for CERN, one of the biggest international particle physics labs, to become a partner.

   Further association with new partners would be desirable.

Conclusions (selected)

Question 6:

*What measures have been created to foster **equal opportunity** and performance-related **career development** and how would you rate their implementation?*

The implementation of performance-related career development seems to be successful: several researchers obtained additional research grants and were offered high-profile positions: Dr. Charlotte Palmer, Dr. Christopher Behrens, Dr. Zhanghu Hu, Dr. Osterhoff, Prof. Dr. Bernhard Hidding, and the four DESY fellows indicates the attractiveness of the VI.

However, possibilities to foster equal opportunities seem not to be fully exploited, the committee strongly encourages the VI to implement additional measures for equal opportunities to raise standards both on the student level and the management level.

Conclusions (selected)

Question 7:

*Does a **transfer** of results take place either by using appropriate measures or by involving suitable partners (e.g. industrial enterprises) or are transfer activities planned? How do you estimate these transfer activities? (Criteria for VIs undertaking application-oriented research)*

There are some transfer activities: two patents have been registered.

However, given the fact that the VI is on innovative new accelerator technologies, it would be desirable for more attention to be paid to these activities. For example, the Wakefield principle is based on relativistic coherence, and thus coherence is realized one way or another and greater coherent products may be attained, such as an injector to a compact XFEL, a compact coherent betatron radiation source, and other shorter-term applications. It should also help to emphasize not only high-energy physics applications but also ultrafast science reach. The latter may have a shorter timeline so that industrial and/or societal applications may develop more easily.

Question 8:

*What **management** and leadership structure has the VI set up and does it lead to effective structures for communication, participation and decision-making between the partners? Are there mechanisms for coordination of the partners as regards new appointments in the VI's field of work?*

Simultaneously, the committee feels the need that all participating institutes, universities and associated partners be more involved in the decision-making process and that communication among all partners could be improved.

Conclusions (selected)

Question 10:

*Should the VI be **further developed or modified** in terms of theme or structure are concerned? If so, in what way?*

The time-line of FLASHForward has slipped by 12 months because of contention for resources within DESY specialist accelerator groups with XFEL and PETRA-III. The VI program has to be adapted accordingly.

There is a need of more advocacy for and priority of FLASHForward in the DESY management. This committee states that this project is fascinating and important enough that the management is advised to champion this point.

Overall result: Rating A; continuation without requirements.

Future & AoB

Comments/reactions to any of the above recommendations?

An easy & immediate reaction to the recommendation for further involvement with decision making and better communication would be to implement the Collaboration Council – which has never met. A. Seryi has agreed to chair this and we could discuss how to get coherent inputs. Meet this afternoon?

We don't want to make FLASHForward a "user facility" in the sense that synchrotron radiation facilities are – indeed this would be impossible - but we do want to encourage participation and ideas for experiments from the community. Ideas on how to best do this would be welcome.

We are arranging another SAC ~ April 2016 where we would want to have addressed at least some of these points.

Comments & AoB?

AGENDA

9.00 Introduction B. Foster

9.20 Status of FLASHForward project J. Osterhoff

9.50 DESY report

Report from WG I A. Martinez de la Ossa

10.10 Report from WG II C. Palmer

Coffee

10.40 Report from WG III L. Schaper

11.00 Report from WG IV C. Schroeder

11.20 Status reports from participating Institutes -

CERN, DESY/UniHH, Frascati, IST, JCU, JAI, LBL, MPI,

SLAC, UCLA

13.00 AoB including future meetings

LUNCH - After lunch – WG parallel-session rooms available