EUROPEAN ASTROBIOLOGY INSTITUTE

Taking European Astrobiology Research, Training and Education one step further

INTERNATIONAL SITUATION

- Astrobiology institutes uniting several institutions exist in several countries (USA, Brazil)
- In Europe recent new initiatives (COST Action, European Astrobiology Campus)
- European & Regional Networks (EANA, Nordic Network of Astrobiology)
- International level: ISSOL & Bioastronomy, IAU Commission
- Creation of an international umbrella organisation has proven unsuccessful
- Parallel inititatives in the field (Diversity of Actors, splitting)
- AstroMap report (under FP 7) recommends European Astrobiology Platform or Institute

RECOMMENDATION OF ASTROMAP REPORT (FP7)

- Resolve fragmentation of the European Astrobiology landscape
- Create a stable European platform/institute in Astrobiology that is
  - science-driven with a strong representation of the community
  - evolving organically from a network of institutes and laboratories,
  - should be flexible and able to adapt to the European and international landscape as well as evolving priorities and breakthrough discoveries.
  - decentralised as much as possible to reap the benefits of European diversity without involving a heavy administrative burden and overhead costs.
  - in a position to provide end-to-end funding with a common (set of) scheme(s) to avoid the complication of various funding procedures
- Look at the model applied by the NASA Astrobiology (virtual) Institute

HISTORY

- European Astrobiology Institute mentioned in COST Action proposal
- European Astrobiology /Institute recommended by Astromap
- Success of the NAI highlighted
- 2 meetings of leaders of main European and Regional Astrobiology Initiatives in Europe (EANA, COST Action TD1308, EAC, NNA, ESF)
- First plans are developed in contact with community

”Always start with a historical summary - all four-eyed fish do that”
Kurt Tucholsky (1890-1935)

GENERAL PROBLEMS IN ASTROBIOLOGY RESEARCH

- Dispersion on programmatic level (Astromap)
- Necessary expertise often distributed at different institutions
- Not prioritised, funding of multi/cross/interdisciplinary projects not easy to get
- Astrobiology not infrequently seen as ”soft science” - killer in proposals
- Sometimes regarded as showbiz science
- Despite public interest in astrobiology field not on the radar screen of politicians
- Access to field sites often difficult for non-insiders
- Not always sole fault of decision makers

EAI ACTIVITIES TO PROMOTE RESEARCH

- Coordinate approach to funding agencies
- Generating a database on field sites (access, formalities, logistics etc.) – - - Cafe database exists already, database wished by NAI also
- Providing information on research infrastructures (proposal calls deadlines, etc)
- Seek partnership with industry in a coordinated and cooparative manner
- Holding a biannual general meeting as a general forum for exchange
- Organising workshops on special themes (by Working Groups and Project Teams)

FIELD WORK AND RESEARCH INFRASTRUCTURES

- Create a database for fiels sites and research infrastructures including
  - Access modalities, proposal deadline and red tape
  - Have contact persons ”Ambassadors” at field sites
- Encourage and promote field work by Early Career Scientists and students
- Apply for funding for Access to Research Infrastructure Network
- Concerted campaign including several teams (one of them consisting of students and early career astrobiologists) at key field sites
- Summer courses and meetings connected to field sites

CHALLENGES IN ASTROBIOLOGY TRAINING

- Astrobiology not priority in curricula
- Didactic challenges in inter-disciplinary teaching
- Astrobiology students sometimes feel isolated
- Expertise not always present in individual institutions
- ECTS system helps, but pitfalls

- Astrobiology courses seen as ”cheap credits”

- Resonance on astrobiology summer schools excellent from both lecturers and students


Astronomers doing Genetics (Iceland 2009)

TRAINING ACTIVITIES

- Complete Astrobiology curriculum from basic to specialised training events
- Develop this curriculum through constant dialogue betweeen studens and organisers (as in EAC)
- Special training events for generic skills (proposal writing, project planning)
- Research infrastructures can be used for training (exposing students to real science
- Support and mentoring of projets by early career scientists
- Meeting for early career astrobiologists and students
- European Astrobiology Campus can function as training entity of EAI
- AbGradE (Astrobiology Graduates Europe) as student organisation

EUROPEAN ASTROBIOLOGY CAMPUS (EAC)

- Initiatialised mainly by members of the Nordic Network of Astrobiology COST TD1308 and Nordic Network of Astrobiology
- Strategic Initiative funded by the ERASMUS+ programme of the EU
- Coordinated by the University of Tartu
- Member organisations
  - 10 Universities (Tartu, Stockholm, Bordeaux, Open University, Porto, Utrecht, Vilnius, Iceland, Turku, Tallinn)
  - 2 external members (Innovaxiom, Cap Sciences)
- Funding ~135 kEUR in total (09/2014 – 08/2017)
- Apart from training, intelectual output and training activities
- Can function as affiliated training entity for the EAI

ACTIVITIES OF THE EAC

- Summer courses
  - Water, Ice and the Origin of Life in the Universe (1- 13 July 2015, Iceland)
  - Formation and evolution of planetary systems and habitable planets (21 – 31 August 2015, Moletaï Observatory, Lithuania)
  - Introductory course (Bordeaux, France, 7 - 13 February 2016)
  - Biosignatures and the Search for Life on Mars (5-16 July 2016, Akureyri, Iceland)
  - Exoplanets (3 - 11 August 2016, Moletaï Observatory, Lithuania)
  - Volcanism, Plate Tectonics and Life (23 August – 1 September 2016, Azores, Portugal)
- Outreach activities
  - Time Trek walking path (Turku, Tartu, Utrecht)
  - River of Time (Bordeaux, Cap Sciences, Utrecht)
  - Workshop on outreach
- Astrobiology summer camp
- Meeting of Young Astrobiologists in cooperation with AbGradE
- Workshop on Education in Astrobiology (IWEA 2)

SUGGESTED TRAINING ACTIVITIES OF EAI

- Basic training schools
  - 1 a year
  - In different countries
- Summer courses
    - Special subjects in science
    - Connected to field work / science procjects
    - Follow-up work
    - Generic skills
- Project planning meeting dor early career astrobiologists
- Mentoring programme
- International Workshop on Education in Astrobiology
- Other activities (Santander, EANA on-line course continue)

OUTREACH ACTIVITIES

- Organise permanent and migrating exhibitions
- Cooperate with museums and museums associations
- Promote distribution of outreach material to make most ut of it
- Coordinate both production and promotion of material for outreach activities
- Use of new techniques in outreach (apps)
- Cooperation with industry
- Extend outreach not only to the general public but also to all possible stakeholders (industry, education authorities, etc.)
- Engage in constant dialogue with press and other media
- Devise and implement strategy on social media
- Involve citizen scientists in research projects

EDUCATION ACTIVITIES

- Provide education material for all levels
- Include all kinds of forms, e. g. books, experimental kits, software etc.
- Encourage translation of material to important other languages
- Promote ways to work with IT in education
- Create Activity Group in outreach and education in the EAI

DISSEMINATION AND INTELLECTUAL OUTPUT

- Endorse coverage of astrobiology in scientific journals by, e.g. proposing special issues.
- Create high-quality reference work (like the Encyclopedia of Astrobiology)
- Organise web-streamed seminars

COOPERATION WITH INDUSTRY

- Although being fundamental science, astrobiology should attracts interest of enterprises in many fields
- Many possible forms of collaboration (internships, sponsoring etc.)
- Contacts to industries often only started under proposal-writing
- Paperwork associated with EU projects often insurmountable for small and medium-sized enterprises
- Continuos dialogue with industrial partners necesseary

INDUSTRY LIAISON OF EAI

- Create an activity group in EAI of both scientists and industrial partners
- Devise novel schemes for collaboration between research and industry
- Alert the scientfic community to cooperation possibilities
- Have an Industrial Liaison Officer in the EAI to act as a link between industry and research and lead the activity group
- Include interested industrial partners into EAI on a permanent basis

MEETINGS

- Lots of meetigs in astrobiology already (danger of the community to ”meet itself to death”)
- One large Astrobiology Conference every second year (Alternating with AbSciCon) in spring
- General Assembly associated with it (in other years associated with specialised workshops)
- Meeting of AbGradE in late summer/early autumn continue
- Smaller workshops both on more special subjects and activities (training, education, outreach)

FUNDING AND LOBBYING

- Create an activity group in EAI dealing with approach of governmental and intergovernmenal organisaton and fundig entities
- Approach and inform decision makers in governmental and non-governmental organisations to promote astrobiology research
- Include decision makers in planning those approaches
- Actively alert individual scientists to funding possibilities
- Avoid duplicate proposals and work for approaching funding agencies in a coordinated and comprehensive way
- Keep a calendar/database for funding calls and deadlines
- Research Infrastructure Starting Community Call (2 stages March 2016 and March 2017)

GENERAL FEATURES OF THE EUROPEAN ASTROBIOLOGY INSTITUTE

- Virtual Institute founded by leading astrobiology institutions
- Inclusive but manageable
- Collaborations of institutions not individuals
  - Local team coordinator at each entity
  - Manageable size of structures and organic growth
  - Members can be both Higher Education and Research Institutions and enterprises, museums, governmental and non-governmental organisations etc.
  - No doubling of existing structures (EANA, ISSOL)
  - One person feeling responsible for astrobiology activities at each institution
- Wide range of activities (Science, Training, Outreach, Networking, Meetings)

STRUCTURE OF RESEARCH IN THE EAI

- Large scale Working Groups (covering main scientific themes)
  - Own Workshops
  - Encouraged to seek own proposals for funding (COST ITNs etc)
  - Permanent structure
  - Represented on theBoard
- Project Teams (like NAI Focus groups)
  - Smaller groups working on special themes, can be temporary
  - Can involve people from one or more WGs (working as link between them)
  - Funding through the ISSI international Team programme or other smaller scale schemes
- Early Career Scientist projects/teams
  - Project teams run by students and early career astrobiologists (can be mentored)
  - Can involve expeditions
  - Can be follow-ups of training school
  - Training on proposal-writing, project management etc. should be provided

SCIENTIFIC WORKING GROUPS

- Formation and evolution of habitable planetary systems
- Origin and delivery of complex organic molecules
- Biosignatures to detect life on early Earth and on other celestial bodies
- Synthesis of biopolymers, self-assembly and formation of first cells
- Early evolution of Life, Earth's geosphere and biosphere
- Habitability, boundary conditions of life and life in extreme conditions
- Medical, psychological and biological issues concerning space missions
- Historic, philosophical, societal and ethical issues in astrobiology

ACTIVITY GROUPS

- Approach to governmental and intergovernmental organisation and funding
- Education
- Outreach
- Dissemination and Intellectual Output
- Industry Liason
- EAC as affiliated training organisation

AFFILIATED ORGANISATIONS

- Existing successful strucures (EAC, AbgradE) can be integrated into EAI
- Can have same status of Working Groups but keep name
- Are Represented on Boeard
- EAC acts as interactive training entity of EAI
  - Develop European curriculum
  - Organising of training events for trainees and trainers
  - Provide interaction forum between students and lecturers to develop training
- Representation of students and early carrer astrobiologists: AbGradE ?
  - Acts as voice for ”young” astrobiologists
  - Organises meeetings for young astrobiologiists

BOARD

- Runs the EAI on a day-to-day basis
- Decides about acceptance and exclusion of new institutions
- Consists of
  - Chair and Vice-chairs of the EAI
  - Chair and Vice-chairs of the Working Groups
- Prepares meetings of the General Assembly and large conferences
- Creates Focus Teams on special subjects
- Prepares reports to funding agencies supporting EAI as a whole
- Approves (financial) reports of events and activities of the whole EAI

BODIES OF THE EAI

Board

- Leading EAI on day-to-day basis
- Organisation of main conferences
- Overall coordination of activities
- Approach decision makers and funding agencies

General Assembly

- All local coordinators
- Elects Chair and Vice Chair(s)
- Approves budget
- Defins overall structure

Working groups

- Scientific & networking activities
- Organisation of specialised workshops
- Organise Focus Groups
- Prepare field work campaigns

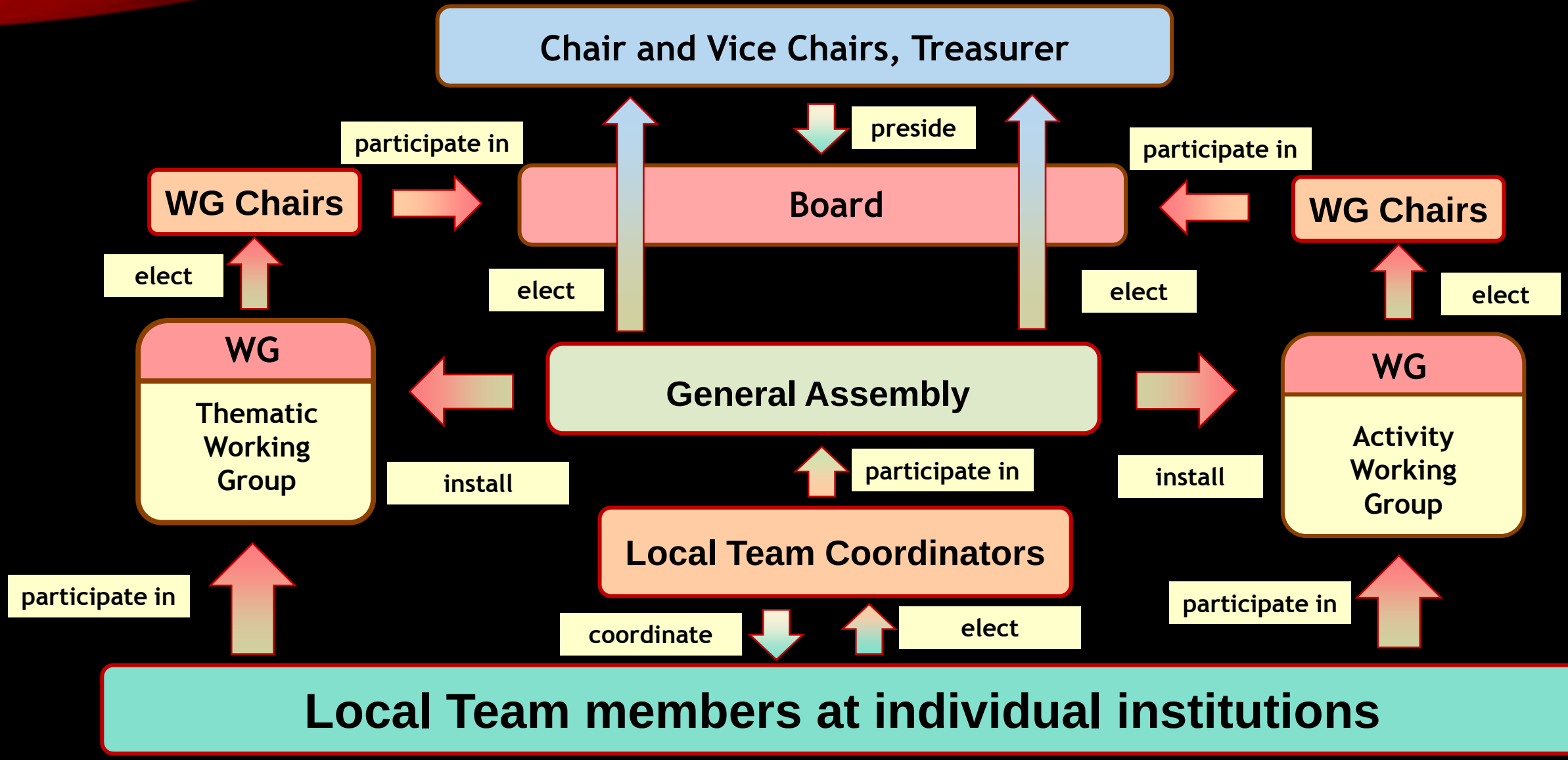
Local Coordinators

- Coordinates local activities
- Represent institution in EAI
- Participaties in General Assembly
- Represents EAI at institution

Local Teams

- Carry out local activities
- Are involved in research projects
- Elect Local Coordinator
- Promote Astrobiology at institution

STRUCTURE OF THE EAI



ADMINISTRATION AND MEMBERSHIP FEE

- EAI could be hosted by ESF (Board and Commision)
- Legal status can be solved
- Euro 1000,- fee for institutions per year (EUR 500,- for institutions from Inclusiveness Country)
- What do institutions get out?
  - Help with funding applications
  - Training programme for their students
  - Reduced fees for participation of members in events

PROPOSED FURTHER COURSE OF ACTION

- Constitute preparatory team from European astrobiology initiatives (DONE !)
- Identify Tasks
  - Decide about name
  - Identify tasks and activities of EAI
  - Cost for instution
  - Propose structure
  - Explore funding possibilities
  - Perform lobbying for EAI at EU and national bodies
  - Contact institutions possibly interested in participating
- Draft Charta (2 pages) to be discussed at the Budapest COST Action (October 2015)
- Get agreement on Charta until end of Year
- Approach possible hosts
- Prepare research infrastructure
- Discuss tasks, management and structure in detail in winter 2016
- Presentation at Vilnius meeting (April 2016)
- Planning and strategy meetingat Liblice, Czech Republic (September 2016)
- Official launch 2018