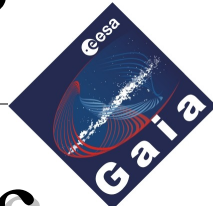
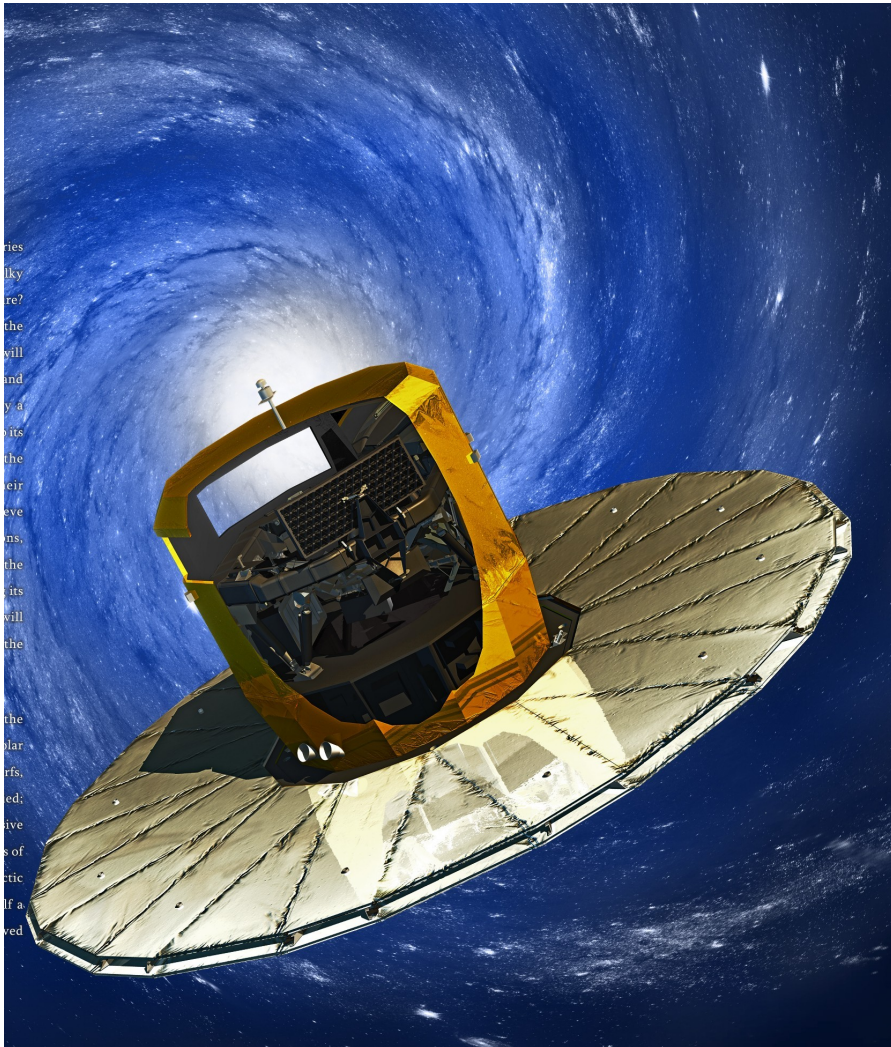


# GREAT Outline and Meeting Goals

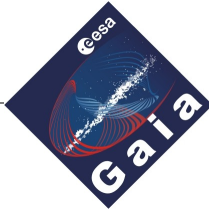


## Gaia Research for European Astronomy Training

Nicholas Walton  
Institute of Astronomy  
University of Cambridge  
&  
Gaia Science Team



# Outline of Meeting

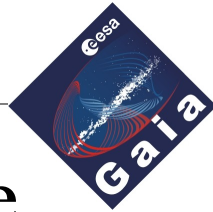


- Thurs a.m.: setting the context
  - update on GREAT, Gaia, the DPAC and ELSA
- Thurs p.m.: setting the science context
  - The science impact of Gaia
  - Aims of the science community
- Thurs p.m./ Fri a.m.: developing the GREAT science network programme
- Fri a.m.: international opportunities
- Fri p.m.: feeding back
  - Building the programme & next steps

# The GREAT Concept

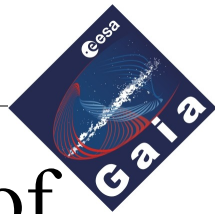
## Scientific Community Building

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- Gaia: towards a more precise understanding of the current structure and history of our galaxy:
  - Distributions of mass, energy and angular momentum
    - Missing mass, dark matter?
  - Signatures of mergers
    - Dwarf galaxies within the local group
  - History of star formation and enrichment of the interstellar dust and gas
  - A better understanding of Solar systems, ours and others
  - A better understanding of the underlying fundamental laws of physics

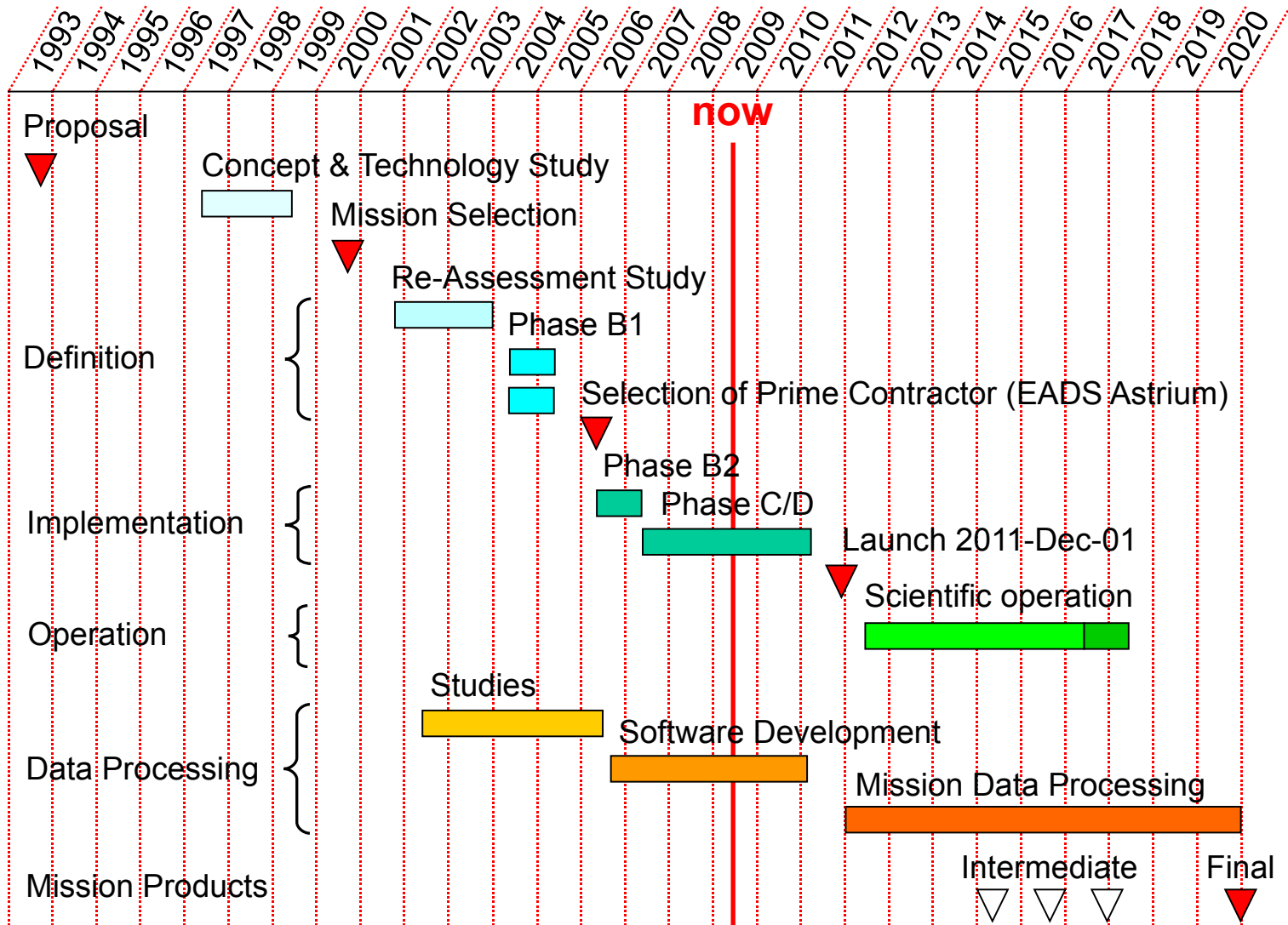
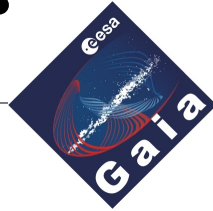
# Mapping Gaia to Science Vision



The AstroNet science vision highlights the key role of Gaia in addressing these major science questions

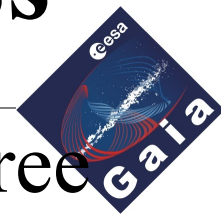
- Obtain a comprehensive census of the orbits, ages, and compositions of stars in our own Galaxy and the nearest resolved galaxies, aiming to produce a complete history of their early formation and subsequent evolution
- Determine the initial physical conditions of star formation, including the evolution of molecular clouds, and the subsequent development of structures in general, and the formation and mass distributions of single, binary or multiple stellar systems and stellar clusters;
- Unveil the mysteries of stellar structure and evolution, also probing stellar interiors;
- Determine the process of planet formation, aiming for a full understanding of the timeline for the formation of planets and the chemical evolution of the material that will eventually end up in exo-planets;
- Explore the diversity of exo-planets in a wide mass range from giants to Earth-like, to characterise the population of planetary systems in relation with the characteristics of their host stars;

# Gaia Timelines: not so far away ...





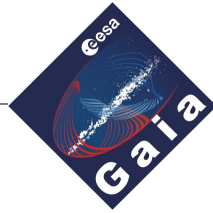
# Not so far away ... build awareness



- Maximising the impact of Gaia requires some degree of coordination
- There are FACILITY opportunities to exploit
  - ESO VISTA, VST as new resources pre Gaia
- There are IT opportunities to exploit
  - VAMDC as a resource of fundamental data
- There are RESOURCE opportunities to exploit
  - EU FP7, ESF, ERC

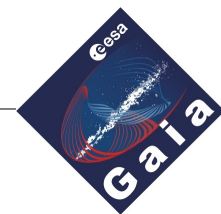
GREAT is an opportunity to strengthen the network of European scientists → maximises the ability to exploit these opportunities → more Gaia Science

# Where does GREAT Fit?



- ESA – charged with delivering the mission
- DPAC – community contribution to Gaia
  - develop the data analysis and processing system
  - run that system & generate the Gaia data products
- ELSA – EU FP6 RTN
  - Training PhDs / PDRAs/
  - Building **technical** expertise of Gaia
- GREAT
  - Community network to increase knowledge and awareness of the **science** potential of Gaia
  - Increase the science impact of Gaia

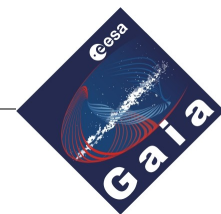
# GREAT Expressions of Interest



- Steps towards GREAT
  - Concept initiated by the GST and developed in partnership with the DPAC Executive
- EoI call to the community issued Sep 2008
  - An significant response – over 60 EoI's received
  - Representing some 90 institutes over ~20 countries
  - Responses formed basis of activities outlined in the ESF call
- EoI's presented a range of interests across Gaia science



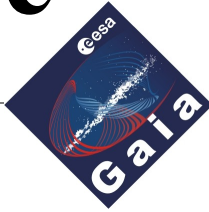
# GREAT EoI's: content



- ~25% EoI's from groups not involved in DPAC
- Good spread of representation from across Europe
- Science spread:
  - 50%: Galactic Archeology, dynamics, galaxy formation
  - 20%: Star formation
  - 50%: Stellar astrophysics, stellar evolution
  - 33%: Extra-solar planets, non-single stars, solar system
  - 20%: Ref. system, fundamental physics
  - 20%: IT challenge
- Some interest in community websites and outreach

**Content for today's breakout discussions**

# ESF Research Network Programme



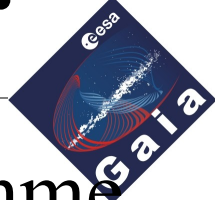
- RNP proposal submitted Oct 2008
- Bid to fund the GREAT research network for 5 years at ~€140K/yr thus €715K in total
- The Programme will include the following activities:
  - Science meetings (workshops, conferences or schools) organised either by the Programme Steering Committee or following an open call for proposals
  - Grants for short and exchange visits awarded following an open call for applications
  - Publication of information brochures and leaflets, scientific books and meeting proceedings etc; creation and management of dedicated websites

# ESF Research Network Programme 2



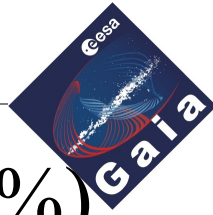
- ESF networking programmes are 'Open'
  - Encouraged to involve the wider community
  - Ideal for the concept of including those that are not co-applicants in network activities
- Period of call is science over 2010/11-2014/15
  - Thus, can factor in access to 'early' Gaia data releases
  - Access to Gaia science alert streams
  - Can also consider science programmes requiring preparatory work (theory, simulations, observational)

# GREAT RNP: how would it work?



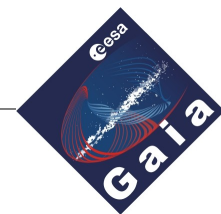
- Science Meetings are organised either by Programme participants or on the basis of an open call for proposals.
  - GREAT will, in the main, have an open call policy
  - 1<sup>st</sup> conference may come from ideas at this meeting
- GREAT ESF RNP Steering committee organise assessment of call proposals
- Budget is ESF administered
  - Total budget available is according to the funded programme – e.g. €40K in 2010 for major conferences

# GREAT Funding



- 2007 ESF call: 15 funded from 122 proposals (12%)
  - No astronomy networks!
- GREAT ESF RNP outcome: final decision Oct 2009
  - Results of 'first cut': mid May 2009
- Alternative funding options
  - National Level support
  - EU Level support
- This meeting provides a springboard for the development of future networking bids

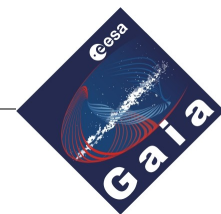
# European Funding Ideas



- ESF: Exploratory Workshops
  - Funds (€15K) a small meeting (30 participants max)
  - Strategically useful to refer to in future larger bids (to ESF, EU)
  - Specific topic focus – astronomy example in 2009: 'Observation, Characterisation And Evolution Of Habitable Exoplanets And Their Host Stars'
  - Next deadline for 2010 meetings: 30 April 2009
    - Aim at a proposal from this meeting.
- ESF: EuroCORES proposal
  - Addresses ideas for science theme
  - Deadline: 29 May 2009

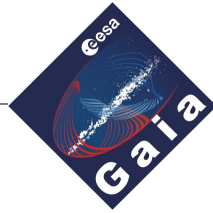


# European Funding Ideas



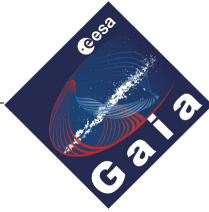
- Initial Training Network
  - Last call (Sept 2008) led to 75 funded proposals from 902 submitted – so 8% success rate → HARD!
  - Astronomy programme → Rocky Planets – thus topical
- Next Call: deadline Jan 2010
- Requires a compulsive theme
  - Build on the programme of ELSA (focus on training the next generation of European Astrometrists)
  - e.g. Training of early stage researchers in the use of Gaia to understand the Galaxy

# GREAT Now



- Supporting a science community
  - A focal point on line presence
  - An on-line discussion and workspace
- GREAT resources
  - <http://www.rssd.int.esa/gaia/GREAT> (soon)
  - <http://www.ast.cam.ac.uk/GREAT> (static pages)
  - <http://camd08.ast.cam.ac.uk/Greatwiki> (interactive)
- Post this meeting:
  - Working and discussion group areas
  - Mailing lists

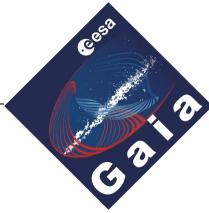
# Meeting Outcomes



- GREAT Kickoff
  - Gauge interest
  - Hear ideas, add detail to the work themes
  - Develop concrete plans for 2010
- What's next – informed by the breakout sessions
  - Working groups on a science theme basis
  - Plans for large observational programmes
  - Plans for new instruments, computations ...
  - Involvement in GREAT network bids
- GREAT Steering committee to draft and circulate

# GREAT Next

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Plenary meeting: Autumn 2009: Nice, France  
Check <http://www.ast.cam.ac.uk/GREAT> for details