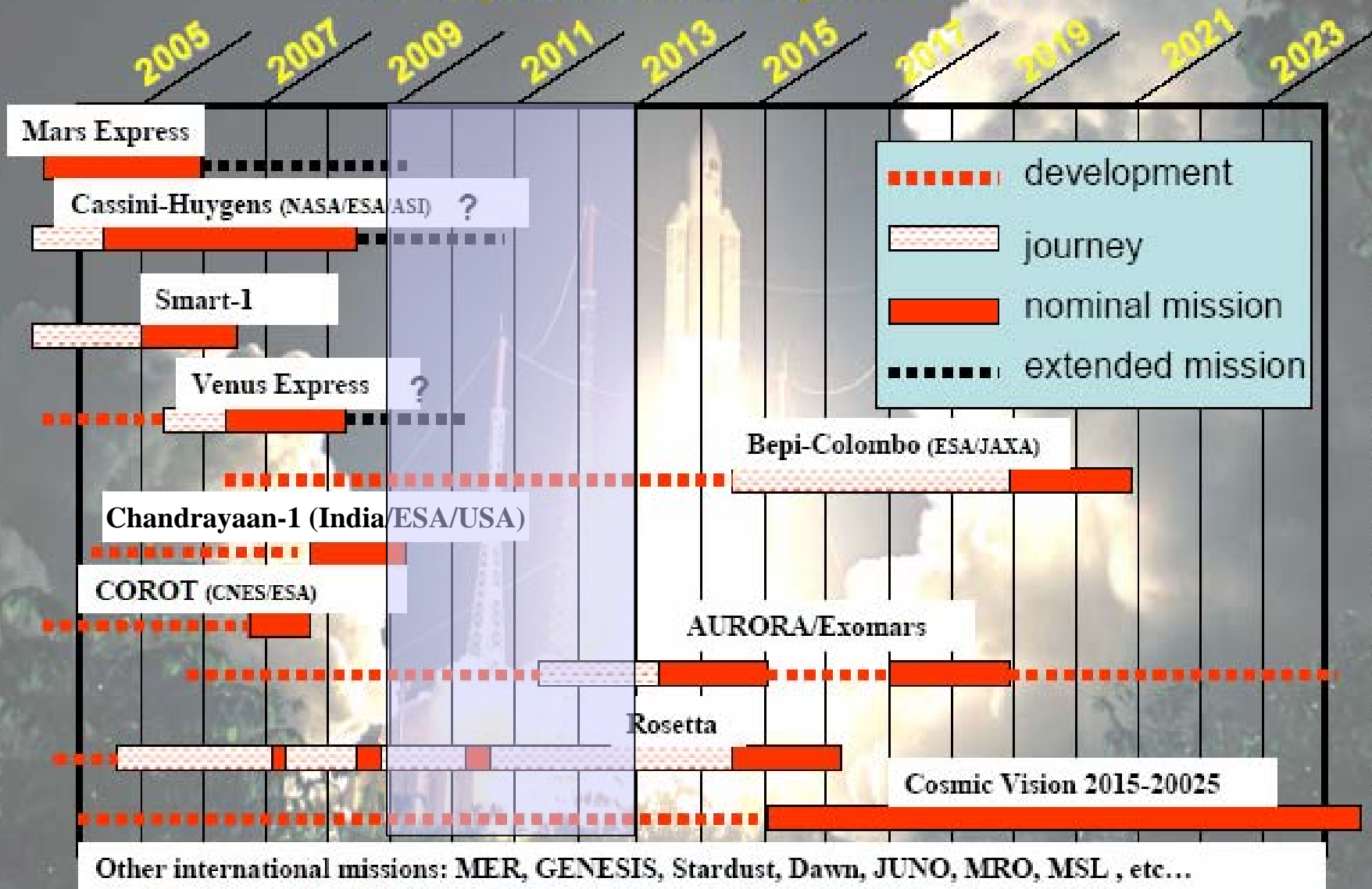


Europlanet FP7 Proposal

- Budget:
 - No more money than in FP6 for all I3's...
 - 4 to 6M€, up to 10-15 for exceptional cases justified by size of community
 - Asking for « too much » will be counterproductive (Daniel Pasini)
- project duration: 4 years maximum
- Number of contractors: 20 is a good number, with a larger number of « users » (e.g. associates)²
- Evaluation will be global, not activity by activity: need to have an internal review process and to present only excellent activity proposals.
- Coordination with other I3's (RadioNet, Opticon and others):
 - Adds value to our proposal
 - Keep stand-alone proposals and show added value through coordination
 - Relevant activities: ground-based observations, numerical simulation,...

European Planetary Missions



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FP7 extension?

- **Identify two main scientific objectives :**
 - **1 - Science activities in support to the optimal use of data from past and present space missions (using IDIS in particular), involving the broad planetary science community beyond the « space club »,**
 - **2 - Science activities in support to the preparation of future planetary missions : Earth-based preparatory observations, laboratory studies, R and D on advanced instrumentation and exploration technologies for the future, theory and modelling, ...**
- **Develop scientific activities, joint publications, dedicated meetings, tools and services, education activities**

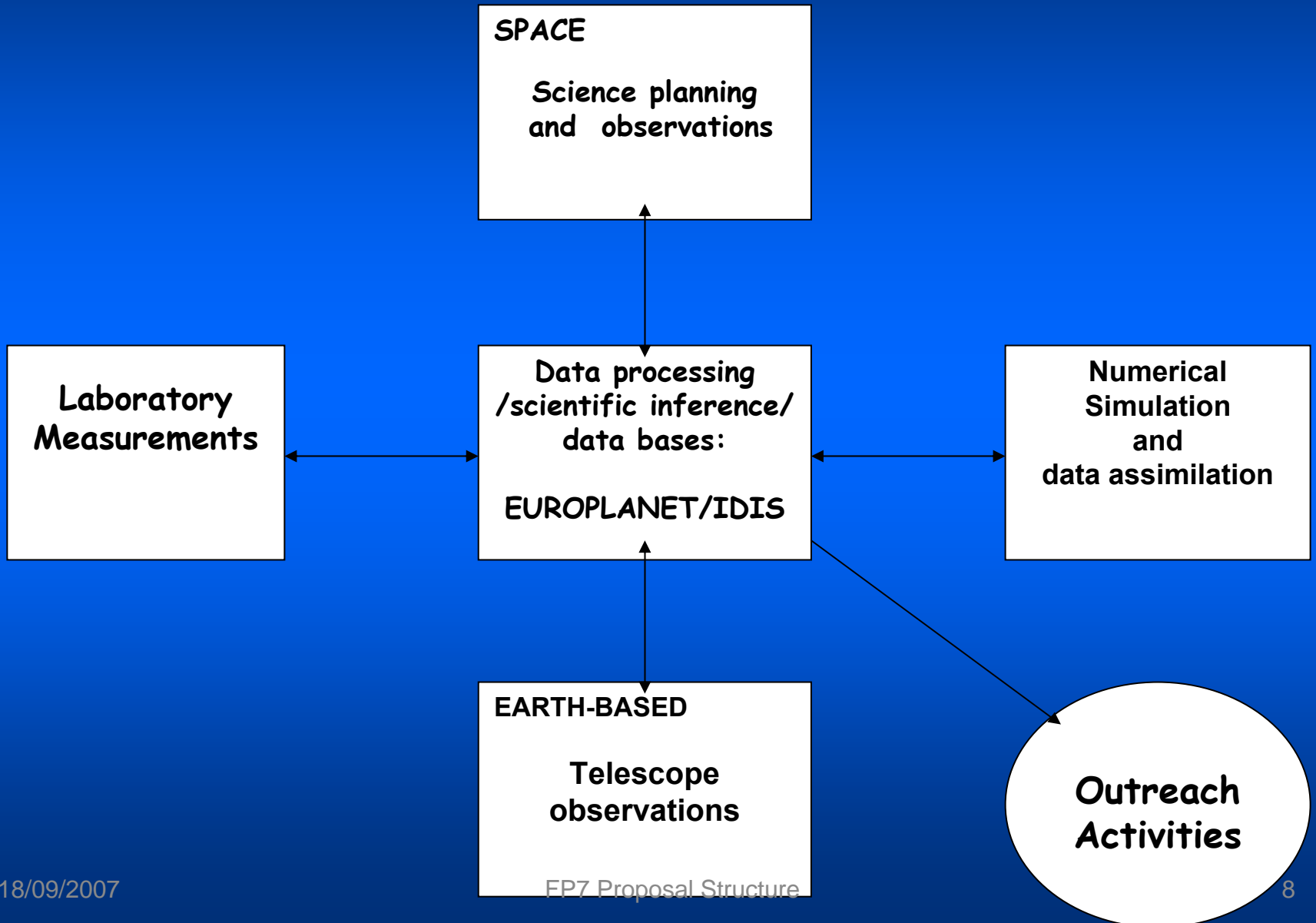
- Europlanet's key objective is to provide « unique » pan-european services to the planetary science community
- 2-D matrix underlying structure:
 - I - Scientific themes (→ working groups + some NA's)
Vs
 - II - Tools and methods (→ JRA's and TNA's + some NA's)
- **New organisational scheme to serve a broad community of users with a focused group of providers**

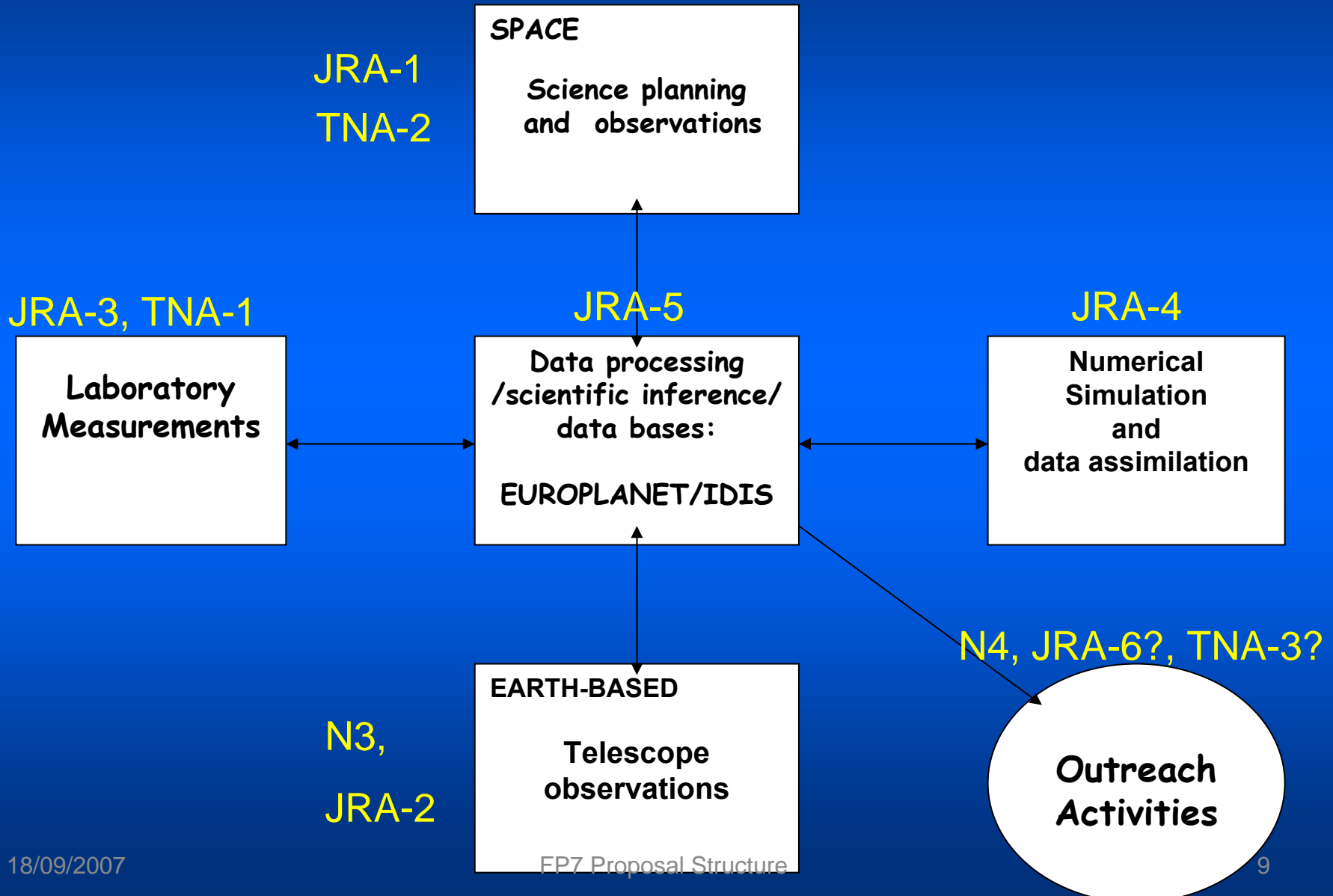
- **Giant planets systems as templates of planetary systems**
(Galileo, Cassini-Huygens, New Horizon, JUNO, Cosmic Vision)
- **Small bodies and origin of the solar system**
(Asteroid and comets missions, Dawn, Rosetta, Phobos-Grunt, New-Horizon, Cosmic Vision)
- **Terrestrial planets and comparative planetology**
(strong link to Earth sciences, MEX, VEX, Chandrayaan, Selene, Phoenix, B-C, Aurora programme)
- **« magnetic worlds »: the Sun-planets connection**
(Ulysses, all planetary missions, SOHO, Stereo and SOLO, Sentinel, synergies with CLUSTER et al.)
- **Exoplanets and Other Planetary Systems**
(strong link to astrophysics community, COROT, KEPLER, GAIA, Cosmic Vision)

Each theme will produce an ISSI refereed book + a pan-european outreach publication (Spatium series)

- Primary data production sources:
 - Space missions
 - Earth-based observations (telescopes)
 - Laboratory and field site facilities
- Higher-level knowledge production tools:
 - Data mining services (IDIS)
 - Advanced data analysis and modelling tools (numerical simulation)
- « Final » knowledge dissemination activities, towards the scientific community and to the public (outreach)

Reminder: initial Europlanet concept





- **JRA-1. Support to space missions science operations and data analysis** (J.-P. Lebreton, contact)
 - Ephemeris
 - Value added and distributed operation tools and services
 - Environmental models
- **JRA-2. New instrumentations for Earth-based observations in planetary sciences** (H. Rucker contact, defined in coordination with other astrophysics-oriented I3's)
- **JRA-3. Lab measurements and characterization** (O. Dutuit, contact)
 - Chemical reactions
 - Mass spectrometry
 - Spectrometry in gas phases
 - Spectrometry in solids
- **JRA-4. Interdisciplinary computational modelling and data analysis (ICM & DA)** ([M. Khodachenko](#), S. Miller, N. Krupp, contact)
- **JRA-5. Planetary VO and data mining** (G. Chanteur, contact)
 - Plasmas
 - Atmospheres
 - Surfaces and interiors
 - Small bodies
 - Techniques
- **JRA-6. European Planetary Outreach Laboratory** (J.-P. lebreton, contact)
 - Targetted audiences - e.g. policy makers
 - Translation and adaptation
 - Pilot projects

- **TNA-1. Lab measurements and characterization (O. Dutuit, contact)**
 - Chemical reactions
 - Mass spectrometry
 - Spectrometry in gas phases
 - Spectrometry in solids

- **TNA-2. Laboratory and fields analogues of planetary environments (M. Grande, contact)**

- **TNA-3. European Planetary Science Media Service (J.-P. Lebreton, contact)**

Community exchange and interaction tools:

- N1. Central Project Management
- N2. Scientific working groups (Norbert KRUPP, Ari-Matti HARI, contacts)
(with wg's adapted to Project structure)
 - 4 Discipline wg's in support to the 4 IDIS nodes
 - 5 thematic w.g.'s for the 5 science themes
 - Ad hoc « tools » working groups ?
- N3. Coordination of Earth-based and Space observations
(Helmut RUCKER, Steve MILLER, Maxim KHODACHENKO, contacts)
- N4. Outreach and Media Relations (Jean Pierre LEBRETON, contact)
- N5. Exchange programme (Odile DUTUIT, Karoly SZEGO, contacts)
- N6. Scientific meetings (Manuel GRANDE, Ralf SRAMA, contacts)
 - Continuation of EPSC
 - W.g. meetings and workshops (see ISSI)

New activity area t.b.d (M. Grande, contact):

- Nx. Planetary instrumentation technology development

- **Jean Pierre LEBRETON (JRA-1 / JRA-6 / TNA-3 / N4):** jean-pierre.lebreton@esa.int
- **Helmut RUCKER (JRA-2 / N3):** rucker@oeaw.ac.at
- **Odile DUTUIT (JRA-3 / TNA-1 / N5):** odile.dutuit@obs.ujf-grenoble.fr
- **Maxim KHODACHENKO (JRA-4 / N3):** maxim.khodachenko@oeaw.ac.at
- **Gérard CHANTEUR (JRA-5):** gerard.chanteur@cetp.ipsl.fr
- **Manuel GRANDE (TNA-2 / Nx):** mng@aber.ac.uk
- **Norbert KRUPP (N2):** krupp@linmpi.mpg.de
- **Ari-Matti HARI (N2):** ari-matti.harri@fmi.fi
- **Steve MILLER (N3):** ucapt0s@ucl.ac.uk
- **Karoly SZEGO (N5):** szego@rmki.kfki.hu
- **Ralf SRAMA (N6):** ralf.srama@mpi-hd.mpg.de

- Sept. 7th: Circulation of first global project guideline (draft structure, # pages, approx. Budget breakdown)
- End sept : Identify all interested parties + form a draft team + identify key contents on each proposed activity
- First half of October: Team sessions
- Second half of october (ISSI): Face-to-face meeting of draft team chairs
- Nov. 15th: First draft with main contents, budget, actions, contractors and users
- Nov. 15th: Issue of call by EC
- Nov. 18th: Distribution of updated draft structure
- Dec. 1st: 2nd drafts delivered
- December : Internal evaluation:
 - SAB member's evaluation
 - Experts in I3 programs evaluation (National Contact Person + « Experts » persons on Infrastructures Projects
- January: Finalisation and integration of draft
- Feb. 15th: Proposal submission due

- Need to evaluate internally each activity proposal, as well as the proposal as a whole
- Each activity draft sent to two reviewers:
 - Scientific content evaluation:
SAB
 - Relevance to EC infrastructure programme:
National contact persons for Infrastructures programme

JRA's

- **Ephemerides tool.** Support to mission planning, space-based and ground-based observation design (incl. occultations, support to amateurs) and data analysis. Thuillot, Dehant, Sicardy,
- **Modelling of planetary atmospheres:** support for mission design, ground-based and space-based measurements and data analysis. Miller et al.
- **Modelling of Mercury environment** (coord with ESA's BC. Contact :Benkhof
- **Multi-point radiation measurements and modelling in the heliosphere** (incl. space weather elements): Contact
- **Solar activity influence on planetary meteorology/climate** at all planets ? Outreach potential ?
- (Coordinated with radionet): **Planetary science applications of radio astronomy observations.** Gurvits et al.

**Lab. measurements and characterization (O. Dutuit, contact) –about
70 labs around 4 topics
with a team for the preparation of the proposal
TNA and JRA**

1. Chemical reactions

Nigel Mason (Open University, UK)

Wolf Geppert (Stockholm, Sweden)

2. Analysis by mass spectrometry

Roland Thissen (Grenoble, France)

Daniela Ascenzi (Trento, Italy)

(?) for mass spectrometry for earth sciences

3. Spectroscopy in gas phase

Yves Bénilan (LISA, France)

(?) Univ. Köln, Germany

4. Spectroscopy in solids

Bernard Schmitt (Grenoble, France)

Develop tools for databases of laboratory data with the specifications of a future Virtual Observatory in planetary sciences

- Outcomes: tools for a better access to existing laboratory databases, critical evaluation with uncertainties, identification of missing data, possibility of potential users to ask for specific lab measurements, etc.
- Users: Identification of potential users (planetary sciences, but also astrophysics (interstellar medium) and other fields)
- Budget: 250Keuros 2 participants
- Workshops for critical evaluation of lab databases coordinated by one participant (Univ. Trento or Perugia, Italy)
- Technical architecture (4 year engineer) coordinated by LPG, Grenoble (CNRS, France)

Strongly connected to the Virtual Observatory / IDIS Activity

- **General Goal** : Creation of a distributed and coordinated RI, based on the existing in Europe computational modelling and data analysis centres, which will provide the scientific community with the dedicated services in the fields of their computational & modelling expertise.
- **Particular goals**:
 - ◆ provide researchers with the **numerical modelling service**;
 - ◆ provide researchers with the **advanced data analysis service**;
 - ◆ perform **coordinated, interconnected, multi-disciplinary simulations of planetary phenomena and objects**: “Virtual Planetary Modelling Lab.”;
 - topical demonstrators (Mars; Giant planets; Planetary space weather);
 - catalogue of available models and tools
 - ◆ provide **coordinated information about access to computing facilities, services (Cooperation between nodes; link to CINECA)**;
 - ◆ **further elaboration of data analysis and modelling methods for their coordinated use by the scientific community**

- **Structure & organizational principles :**

- ◆ ICM & DA JRA will consist of a set of Working Packages (WPs) related to particular type of modelling, data analysis or R&D activity;
- ◆ each WP has its responsible leader and team (group of scientists / labs);
- ◆ the number of WP is not yet fixed, but it should be consistent with the budgetary capabilities to provide the efficient realization of all WPs;
- ◆ coordination of ICM & DA, as a distributed RI, will be performed by the Board of Experts (leaders of WPs);
- ◆ R&D part of the ICM & DA will include the WPs focused on the coordinated efforts regarding standardization, model inter-comparison, -facing, etc.
- ◆ to reach its goals on establishing dedicated modelling and data analysis services, ICM & DA will develop and provide:
 - Specialized user services within particular WPs
 - Flexible schedules
 - Topic oriented tutorial teams + communication
 - Broad advertising of the available services

Collect and make accessible information about space- and ground-based instruments, their capabilities, responsible institutes and persons, and data including modelling results related to the field of

- **Interiors and Surfaces:**
solar system bodies' surface and interiors and related research
- **Atmospheres:**
solar system bodies' atmospheres and related research
- **Plasma Science:**
solar system bodies' plasma environment and related research including interaction with solar wind, upper atmospheres and surfaces
- **Small Bodies and Dust:**
small solar system bodies like comets, asteroids and dust and related research
- **Information Access Support for Users:**
Develop and implement services to give users easy-to-use access to the information and data available through the nodes listed above.

TNA's

- Budget: 500 k€
- Service providers must be participants (contractors) (no sub-contracts!)
- We identified a few laboratory facilities, which are “unique” or very specific
- The number of potential users (not only for planetary sciences) has to be evaluated

with 5 participants which can be common to other NA, JRA, TNA (CNRS, INAF, ...)

1. Very low temperature chemical reactions and spectroscopy
Rennes, Toulouse, Créteil, Grenoble (CNRS, France)

2. Specific mass spectrometry analysis, Nancy +? (CNRS, France)

3. Dust analogues

Napoli (INAF, Italy), Open University (UK)

4. Ion storage ring for $M^+ + e$ reactions (Stockholm, Sweden)

5. Astrobiology (Madrid, Spain)?

Others??

- A network of facilities providing analog planetary environments:
 - Terrain
 - Terrestrial extreme environments
 - Wind
 - Radiometric
 - Thermal
 - X-ray
 -
- Users will bring instruments to the facility for development and testing in a representative planetary environment
- Help machines learn to be intelligent planetary scientists

- Will need to work with expert customers to establish requirements and share know-how
- Importance of calibrated environments
- Central coordination to arrange access and define interfaces
- Benefit to EU is synergy, sharing experience and facilities, avoidance of duplication

Networking Activities

New aspects and new activities

Focus Points

- **Space Mission complementary observations**

Ground based observations of potential targets that are, will, or have been observed by spacecraft instruments, with the aim to complement (wavelength, time, geometry) the scientific results.

- **Space Mission supporting observations**

Assist in the preparation or in the operational stage of a planetary mission (engineering as well as scientific aspects of the mission). Examples: Titan atmosphere observations prior to the Huygens descent, comet observations for Rosetta mission, etc.

Strategic areas for FP7

- Planetary aurorae - indicators of magnetospheric activity and magnetosphere-atmosphere coupling
- Atmospheric winds and circulation - mechanisms for driving weather systems and energy distribution
- Planetary surfaces - the results of geological processes and potential life-supporting habitats
- Meteoroid and comet studies - comparative study of meteoroid-planet interactions in the inner solar system
- Observational studies of Mercury
- Stellar occultations
- Extra-solar planets - transferring our understanding of the solar system to predict and interpret future observations

Motivation and Objectives

- Planetary science is highly relevant and interesting for European citizens - they have a right to be informed and involved

Changing the culture

- European planetary science is relatively under-represented in the media (c.w. US)

(on both sides)

- European planetary scientists need resources, training and professional assistance in their outreach activities and media contacts

- **Outreach and media relations - NA**
 - website
 - network of national planetary outreach contacts
 - sharing resources and expertise
 - evaluation tools and strategies
 - training
- **European Planetary Media Service - TNA**
 - mobilising the European community
 - channelling stories into the media
 - “first port of call” for media enquiries
- **European Planetary Outreach Laboratory - JRA**
 - pilot projects
 - targetted audiences - e.g. policy makers
 - translation and adaptation

FP6 - re-active

FP7 - pro-active

A Network of instrument users and providers

- Take inventory of needs
- Provide forum for those who specify new instruments and those who can produce them
- Identify key developments needed
- Facilitate development of new planetary instruments and technologies

Additional slides

- Participants and associates:
 - For FP7, distinguish PROVIDERS and USERS of activities, meetings, tools, services. Maybe only providers would sign the contract to the E.U., services being made available to all labs.
 - A limited number of « PROVIDERS » will sign the contract, receive and manage funds (proposition) and will be called the « participants »
 - « USERS » will be called « associates », they will be able to participate to all activities according to their own interests
- « Governing body »
 - Coordinator and Board
 - Project Scientist
 - Project manager
- Activities (NA's, TNA's, JRA's with their own administrative support)
 - Identify coordinators, lead institutes, work plan, budget, core team to design the proposal

Motivation and Objectives

- **Observations are an important aspect of modern planetary science**
- **Earth-based observations can complement spacecraft data in various aspects:**
 - **increase of spatial and temporal resolution;**
 - **availability of multi-frequency observations;**
 - **provide a different observation geometry**
- **Need of upgrade and further development of the up-to-date observational facilities**