

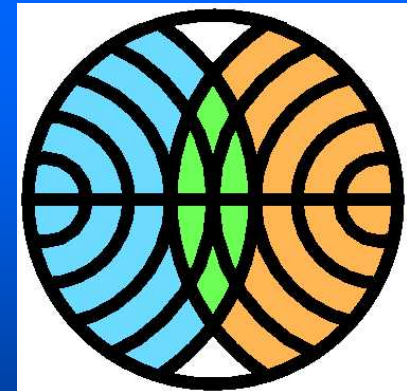
N2

Discipline working groups

Status, May 2006



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- **N2 Website:**

<http://www.mps.mpg.de/de/projekte/europlanet>

Outline implementation:

- Month 1: set-up of the working groups,
define scientific key questions for each discipline working group
- Month 2: N2-meeting #1, together with Europlanet kick-off meeting and N4, N7 workshops
- Month 4: N2-meeting #2 in combination with meetings of activity N3 and N6 and EGU conference
- Month 5-8: activate action plan with co-ordination of modeling work and observation campaigns
begin of working period
- Month 8: N2-meeting #3, preliminary review and refinement of science objectives,
eventually with N3 workshop
- Month 10: N2 report during General assembly of Europlanet
- Month 11-15: working period

Outline implementation:

- Month 16: N2-meeting #4 in combination with meetings of activity N3 and N6 and EGU conference
- Month 17-21: working period, special publication
- Month 22: N2-meeting #5 in combination with meetings of N3, N4, N7
- Month 23-27: working period
- Month 28: N2-meeting #6 in combination with meetings of activity N3 and N6 and EGU conference
- Month 29-33: working period
- Month 34: N2-meeting #7 in combination with meetings of N3 and N6
- Month 35-39: working period
- Month 40: N2-meeting #8 in combination with meetings of activity N3 and N6 and EGU conference
- Month 41-45: working period, special publication
- Month 46: Closure meeting with N3, N4, N7

- Month 1-9: set-up of the working groups,
define scientific key questions for each discipline working group
- Month 4: Europlanet General Assembly with N2 presentation, Vienna, Austria
- Month 4: Participation at N3 kick-off meeting
- Month 9: First N2-ISSI cooperation meeting, Bern, Switzerland (workshop proposals)
- Month 11: N2-meeting #1, Northeim, Germany
- Month 11: Europlanet meeting Brussels with N2 presentation
- Month 11: Participation at N3 workshop in Graz, Austria
- Month 14: Second N2-ISSI cooperation meeting, Bern, Switzerland
- Month 15: Participation at N4 workshop in Toulouse, France
- Month 16: Participation at N3 workshop in Vienna, Austria
- Month 16: N2-N7 workshop, Villafranca, Spain
- Month 17: Europlanet coordinator meeting, Paris, France

- allocated:
 - 10% of 2 Mio € = 200000 € -> 50000 €/year
 - 2000 for Toulouse
 - 10000 for coordinators
 - 38000 for activity
- received:
 - 57600 € for the first 18 months = % of allocated budget
- spent:
 - as of May 18: 40800 € = %
 - telecons ?
- planned:
 - Aug 2006: N2 meeting #2 at FMI, Finland
 - Oct/Nov 2006: N2 meeting #3 at MPS, Germany

Date	travel	other	sum		comments	
Jan 05		5000	5000		coordinator costs to FMI	Harri
Sep 05	477,81		477,81		ISSI Bern	Krupp
Nov 05	13960,68	5319,8	19280,45		N2 meeting Northeim	all
Nov 05	669,7		669,7		EPN Brussels	Grieger
Nov 05	690,31		690,31		N3 workshop	Jones
Year 2005				26118,27		
Jan 06		5000	5000		coordinator costs to FMI	Harri
Feb 06	357,12		357,12		ISSI Bern	Krupp
Mrz 06	1299,02		1299,02		N4 workshop Toulouse	Krupp
Apr 06	8029,49		8029,49		N2-N7 workshop Villafranca	all
Year 2006				14685,63		
Sum	25484,13	15320	40803,9			

preliminary, will be updated !!!

N2 budget FMI (2005)

YEAR 1	DIRECT COSTS						INDIRECT COSTS	
	personnel cost	travel	consumables	equipment	subcontracting	TOTAL	overheads	20%
January	0.00					0.00	0.00	
February	0.00					0.00	0.00	
March	0.00					0.00	0.00	
April	381.30	1 323.45				1 704.75	340.95	
May	289.39					289.39	57.88	
June	315.30					315.30	63.06	
July	260.85					260.85	52.17	
August	0.00					0.00	0.00	
September	0.00					0.00	0.00	
October	16.92					16.92	3.38	
November	4 226.43	1 670.15				5 896.58	1 179.32	
December	0.00	908.42				908.42	181.68	
TOTAL COST	5 490.20	3 902.02			0.00	9 392.22	1 878.44	
PLANED						5 000.00		
REMAINING					0.00	-4 392.22	-1 878.44	
						Total costs	11 270.66	
						Remaining	-6 270.66	

Milestones:

- set-up of discipline working groups, invitation of experts
- define science key questions for each discipline working group
- activate action plan with co-ordination of modeling work and observations
- Two N2 meetings per year, refinement of objectives, preparation of special publications

Deliverables:

- report about activities in N2 during general assemblies
- motivate new observation campaigns and modeling work
- common publications

The expected outcome of this activity is:

- Identification of the world leading experts for each discipline working group.
- Definition of the scientific targets to be tackled with the latest data sets.
- Collect the inputs of each discipline working group for planning and coordination of future observations, laboratory and modeling work as well as analysis of data measured from the ground or on board spacecraft.
- Publications of the results from each discipline working group

2. List of deliverables

Activity (NAx)	Deliverable No	Deliverable Name	Workpackage /Task No	Delivered by Contractor(s)	Planned (in months)	Achieved (in months)
N2	D2.1	List of working group members		15.1 30	4-9	9
N2	D2.2	ISSI proposal		15.1 30	5	5
N2	D2.3	Minutes of kick-off meeting		15.1 30	9-11	11

Deliverable/ Milestone No	Deliverable/Milestone Name	Workpackage /Task No	Lead Contractor(s)	Planned (in months)	Achieved (in months)
D2.1	List of members for each discipline working group		MPG-MPS	1-9	9
D2.2	Proposal for cooperation with ISSI, Bern, Switzerland		MPG-MPS FMI		
D2.3	minutes of kick-off meeting		MPG-MPS FMI	4-9	11
M 2.1.1	setup of members for each discipline working group		MPG-MPS	1-9	9
M 2.3.1	N2 kick-off meeting, Nov 21-23, 2005		MPG-MPS FMI	9	11

Date	Title/subject of meeting /workshop	Location	Number of attendees	Website address
21.11.05- 23.11.05	N2 kick-off meeting	Hotel Gesundbrunnen, Northeim, Germany	30	http://www.mps.mpg.de/de/projekte/europlanet/

Aims: What is the origin of the planetary modulated (quasi-periodic) signatures at Saturn?

Modelling:

Wave theory: investigate the global response of the magnetosphere to external/internal perturbations.

Solar wind-magnetosphere-ionosphere coupling (Leicester, Warsaw)

New global magnetic and plasma models (IC, Braunschweig, MSSL, U. Michigan, JHU/APL)

Observations:

magnetic field, particle data, radio emissions, energetic neutral atoms, UV observations from Cassini/Hubble Space Telescope, InfraRed Telescope Facility, Chandra X-ray Observatory, X-ray Multi-Mirror

Expertise:

DWG2 + Cassini Teams and PIs, Jean-Claude Gerard, Denis Grodent, Randy Gladstone, Graziella Branduardi-Raymont + other theoreticians/frequency analysis experts

Initiate collaborations with new scientists

Correlate multi-instrument and multi-observatory data sets

Use of models/expertise to characterise quasi-periodic signatures

Aims: Can we detect an exoplanet magnetosphere now?

Modelling:

- comparisons with Jupiter and other magnetospheres

- consider sub-sonic versus super-sonic interactions

- consider sub-Alfvenic versus super-Alfvenic interactions

Observations:

Future radio emissions could indicate the presence of a magnetosphere (LOFAR from 2008-2010)

Expertise:

Uwe Motschmann, Helmut Rucker, Pekka Janhunen (FMI) Gombosi/Hansen

Initiate collaborations with new scientists

Extend available planetary models to exoplanetary conditions

Specific Suggestions	Milestones
Aim: Investigation of solar-planetary interactions	
<p>Modelling: <i>New solar wind propagation modelling – to investigate different solar wind conditions at different orbital distances</i></p> <p>Observations: <i>2003/2004 interval: Cassini (~9AU), Ulysses (~5AU), Mars Express (~1.5AU), ACE (~1AU), solar monitor (SOHO ?)</i> <i>Other intervals : Mariner10, Messenger, Venus Express, New Horizons ?</i></p> <p>Expertise: <i>DWG2 + Gombosi/Hansen, R. Prange, J. Luhmann, D. McComas, J. Slavin +others</i></p>	<p>Initiate collaborations with solar system scientists</p> <p>Establish a solar wind propagation model</p> <p>Construct a database of multi-spacecraft observations</p>
Aim: What is the influence of the solar wind interaction at Jupiter?	
<p>Modelling: <i>Solar wind-magnetosphere-ionosphere coupling (Leicester, Warsaw) e.g. reconnection rates, cusp processes</i> <i>New global magnetic and plasma models</i></p> <p>Observations: <i>Millennium Campaign at Jupiter (Cassini, Galileo, Hubble Space telescope (UV), Chandra X-ray Observatory, X-ray Multi-Mirror, InfraRed Telescope Facility)</i></p> <p>Expertise: <i>DWG2 + Gombosi/Hansen, Graziella Branduardi-Raymont</i></p>	<p>Initiate collaborations with new scientists</p> <p>Further development of existing models</p> <p>Create a database for the Millennium Campaign</p> <p>Recommendations for future ESA jovian mission:</p> <ul style="list-style-type: none"> - <i>multi-spacecraft observations</i> - <i>solar wind monitoring</i> - <i>dedicated moon orbiters</i>

- Understanding super-rotation (Grieger)
- Ion-neutral chemistry at Titan (Leblanc)
- Solar wind interaction at Jupiter and Saturn including aurorae (Krupp)
- What is the origin of the planetary modulated (quasi-periodic) signatures at Saturn? (Krupp)
- Investigation of the interaction of magnetospheric plasma with icy moons in the Saturnian system and other giant planet systems (Krupp)
- Definition and archiving of ground-based observations in support of space missions (Coustenis)
- Catalogue of IR and Raman spectra of gas CH₄ coefficients, organics (Coustenis)
- Dating planetary surfaces from cratering processes: formation of the solar system (Coustenis)
- Quantifying the Martian geochemical reservoirs (Toplis)
- Exchange processes between surface and interior of icy moons (Grasset)
- What are the relative contributions of asteroidal dust, cometary dust, meteor streams, interstellar dust and circumplanetary dust to the structure of zodiacal cloud as a function of heliocentric distance, latitude and time (Graps)
- What is the dynamical and morphological structure of the Kuiper belt (Graps)
- How can we best optimize from observations, numerical experiments, lab simulations, further analysis of past mission data, the science return of Rosetta
- Solar wind-comet surface interaction (Schmidt)
- Surface material composition (Schmidt)
- Distant activity, outbursts, splitting and disruption of cometary nuclei (Makinen)
- Planets under extreme stellar conditions (Lammer)

1 - Objective or science goal:

Solar wind interaction at Jupiter and Saturn including aurorae?

2 - Needed data sets:

Millennium Campaign at Jupiter (Cassini, Galileo, Hubble Space telescope (UV), Chandra X-ray Observatory, X-ray Multi-Mirror, InfraRed Telescope Facility), other ground-based observations

Saturn Hubble campaign 2004

3 - Problem description

Modelling of the Solar wind-magnetosphere-ionosphere coupling e.g. reconnection rates, cusp processes and compare it with existing data sets.

Variations of particle fluxes, pitch angle distributions, energy spectra, aurora brightness,... as indicators of solar wind influence.

4 - Current solution: the way scientist presently work to select data of interest, to access these data and to process it.

PDS, MAPS KP, direct contact between scientists

5 - What services users expect from an IDIS to work more efficiently

add new data sets (relevant events on the Sun, additional data sets from missions in Earth orbit and in the heliosphere for a given time period), add new global transport and plasma models, add relevant Laboratory measurements

6 - Other comments

7 - Key references on science and methodology for this science case

*Cowley and Bunce, Clarke et al., Crary et al, Hansen et al., Tomas et al.,...
experience from Earth magnetosphere,...*

1 - Objective or science goal:

What is the origin of the planetary modulated (quasi-periodic) signatures at Saturn?

2 - Needed data sets:

magnetic field, particle data, radio emissions, energetic neutral atoms, UV observations from Cassini/Hubble Space Telescope, InfraRed Telescope Facility, Chandra X-ray Observatory, X-ray Multi-Mirror + Voyager and Pioneer data sets

3 - Problem description

Investigate the global response of the Saturnian magnetosphere to external/internal perturbations.

4 - Current solution: the way scientist presently work to select data of interest, to access these data and to process it.

PDS, MAPS KP, direct contact between scientists

5 - What services users expect from an IDIS to work more efficiently

add magnetic field models of Saturn, time-series analysis tools

6 - Other comments

7 - Key references on science and methodology for this science case

Mitchell et al., Kurth et al., Krupp et al., Gambieri et al., Espinosa et al., Arridge et al.,...

1 - Objective or science goal:

Investigation of the interaction of magnetospheric plasma with icy moons in the Saturnian system and other giant planets systems

2 - Needed data sets:

particle and fields data sets of Cassini, Voyager and Pioneer data sets

3 - Problem description

Investigate moon-magnetosphere interaction processes and their mutual effects (on the magnetosphere in terms of sources and sinks, on the moon surface via weathering and induced chemistry),

investigate the transport mechanisms in Saturn's magnetosphere by using absorption signatures (determine diffusion coefficients)

4 - Current solution: the way scientist presently work to select data of interest, to access these data and to process it.

PDS, MAPS KP, direct contact between scientists

5 - What services users expect from an IDIS to work more efficiently

add laboratory and model data, provide additional parameters necessary (sputter yields,...)

6 - Other comments

7 - Key references on science and methodology for this science case

Paranicas et al., Roussos et al., Ip et al., Johnson et al., ...

Workshop topics to be proposed to ISSI

(Outcome of telecon May 12, 2006 with M. Blanc, B. Grieger, A.-M. Harri, N. Krupp)

For 2007

- Climate and atmospheric circulation of terrestrial planets (Grieger)
- Planetary atmospheric electricity (Lebreton, Leblanc)
- Exchange processes from the deep interior to the surface of icy moons (Grasset)

For 2008

- Quantifying the Martian geochemical reservoirs (Toplis)
- Planetary aurorae and their electrodynamic drivers: solar wind vs. internal processes (Krupp)
- Solar wind – comet surface interaction (Schmidt)

Not selected this time:

- Planetary chemistry issues in support to the analysis of space mission data (Coustenis)
- What are the connections between TNOs, Centaurs, Trojans, comets and icy satellites and what is the dynamical and morphological structure of the Kuiper belt (Graps)
- How can we best optimize from observations, numerical experiments, lab simulations, further analysis of past mission data, the science return of Rosetta (Graps)
- Distant activity, outbursts, splitting and disruption of cometary nuclei (Mäkinen)
- Planets under extreme stellar conditions (Lammer) (2008)

Workshop topics “selected” from ISSI

(Outcome of ISSI science committee meeting, May 2006)

For 2007

- Planetary atmospheric electricity (Lebreton, Leblanc)

For 2008

- Exchange processes from the deep interior to the surface of icy moons (Grasset)
 - Quantifying the Martian geochemical reservoirs (Toplis)
- in addition:
- Planetary aurorae and their electrodynamic drivers: solar wind vs. internal processes (Krupp)

- Support N7 and other activities
- Support N5 (EPSC science cases session in Berlin)
- second full N2 meeting in August 2006 at FMI
- Plan ISSI workshops if selected