



International Max Planck Research School
for Astronomy and Cosmic Physics at the University of Heidelberg



Opening 2nd academic year: Sept. 25, 2006

1) Welcome address by IMPRS spokespersons:

Prof. H.-W. Rix (Max Planck institutes), Prof. S. Wagner (university institutes)

2) Introduction to IMPRS (Fendt, IMPRS coordinator):

IMPRS newcomers: applications, new members

IMPRS structure: positions (time)

IMPRS people: who is who

IMPRS curriculum: mandatory courses, course time schedule

3) Welcome barbecue --> Monday, October 9, 16:00 (??)

IMPRS applications 2006:



--> 100 applications received (67 male, 33 female)
2005: 82 applications (55 m, 27 f)

--> Europe / West :

Italy	13
Germany	12
Spain	5
UK	3
Austria	1
Finland	1
France	1

--> Europe / East :

Bulgaria	2
Romania	2
Ukraine	2
Hungary	1
Poland	1
Russia	1
Tschech R.	1

--> Arabia :

Iran	4
Lebanon	1
Egypt	1
Turkish R.	1

--> Asia :

India	12
Taiwan	3
Korea	1
Pakistan	2
Bangladesh	1
Indonesia	1
Thailand	1

--> Africa :

South Africa	2
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--> America/ North :

Canada	2
USA	1

--> America/ Latin :

Chile	3
Argentina	3
Brazil	1
Ecuador	1
Mexico	1
Peru	1

--> 23 new IMPRS students (2005: 17)

IMPRS students 2006:



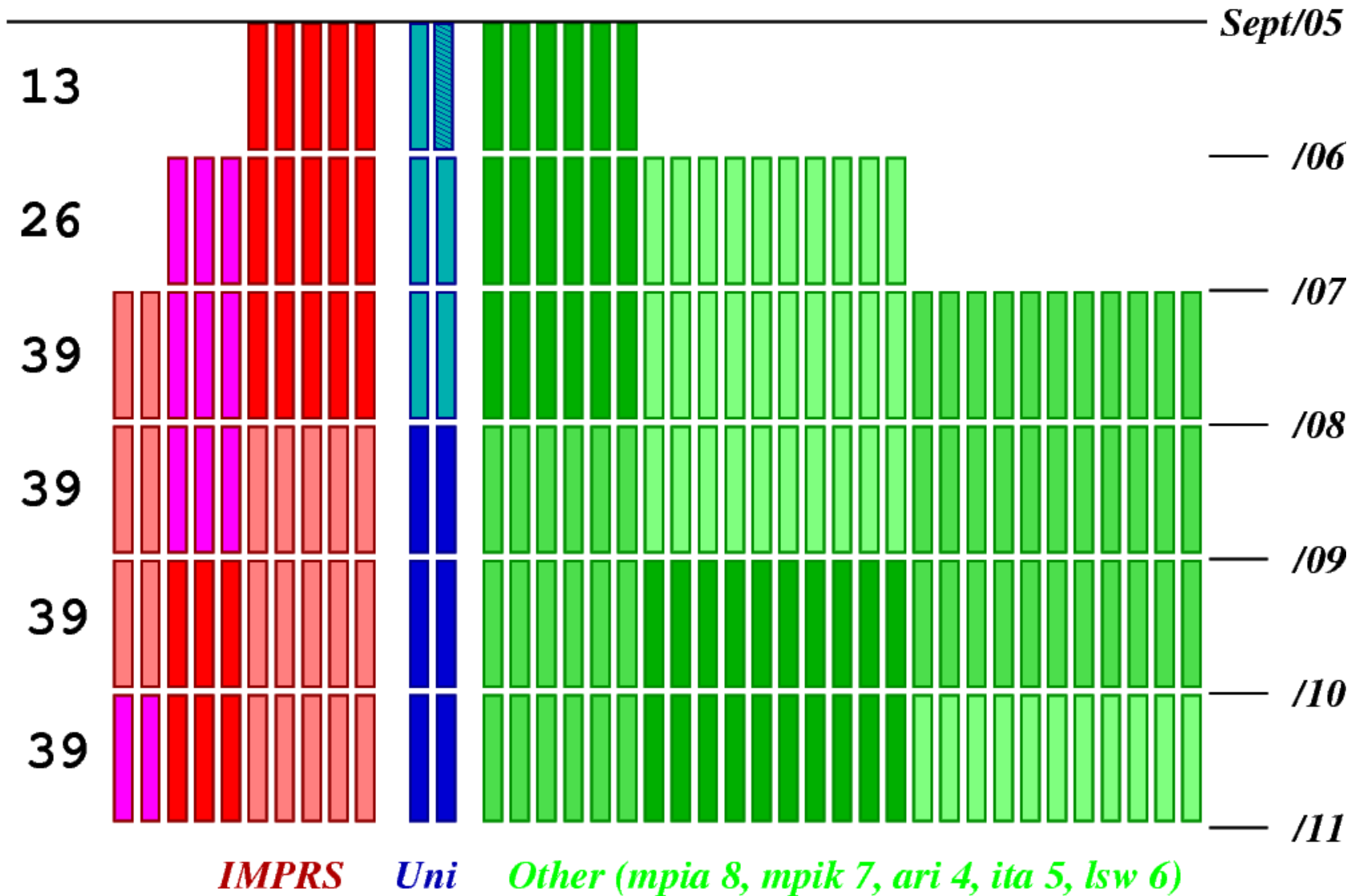
	Name of applicant	Origin	Thesis topic	Supervisor	Status	Arrival
1	Anguita, Timo	Chile / HD	Gravitationally lensed quasars	Wambsganss	Blue	Nov.-05
2	Barnabe-Heider, Marik	Canada / HD	GERDA: search of neutrinoless double beta decay	Schoenert	Green	Sep.-05
3	Behera, Bagmeet	India-USA	IR cosmic extragalactic background light from TeV gamma	Wagner	Red	July-06
4	Bocchi, Matteo	Italy-HD	MHD jet instabilities	Camenzind	Green	Nov.-06
5	Cacciato, Marcello	Italy	Cosmology, early universe, DM	v.d. Bosch / Bartelmann	Red	May-06
6	Downing, Jonathan	Canada	Globular and Young Stellar Clusters	Spurzem	Red	Aug.-06
7	Ernst, Andreas	Germany-HD	Young star clusters in galactic nuclei	Just / Spurzem	Blue	Jan.-06
8	Fallscheer, Cassandra	USA	Disks in massive star formation	Beuther	Red	Aug.-06
9	Golombek, Irina	Germany-HD	Non-thermal emission of galaxy clusters	Bartelmann	Blue	Feb.-05
10	Hofmann, Jan	Germany-HD	Disk accretion, cosmology, theory	Duschl	Red	Mar.-06
11	Kuiper, Rolf	Germany-HD	Modelling disks in the formation of massive stars	Klahr / Henning	Red	Sept-06
12	More, Surhud	India	Cosmology, extragalactic, open	van den Bosch	Red	May-06
13	O'Sullivan, Jamie	Ireland	Simulations of magnetized Herbig-Haro flows	Camenzind	Blue	Jan.-06
14	Pedaletti, Giovanna	Italy	TeV emission from supermassive black holes	Wagner	Red	Apr.-06
15	Robaina, Aday	Spain	Eight billion years of galaxy merging	Bell	Red	Aug.-06
16	Rodon, Javier	Argentina	Fragmentation of massive star-forming clusters	Beuther	Red	July-06
17	Schwab, Christian	Germany-DA	IR space instrumentation and optics	Krause / Henning	Red	Feb.-06
18	Schwemmer, Stefanie	Germany-HD	Gamma-ray astronomy with the H.E.S.S. telescopes	Puehlhofer / Wagner	Blue	Nov.-05
19	Skelton, Rosalind	South Africa	Galaxy mergers: theory meets observations	Bell / Somerville	Red	Sept-06
20	Vasyunin, Anton	Russia	Astrochemistry in protoplanetary disks	Henning	Red	Sept-06
21	Xiang-Gruess, Meng	Germany-HD	Theory, galaxies, planets	Duschl	Blue	Mar.-06
22	Zatloukal, Michael	Germany-S	Search for distant galaxy clusters	Roeser	Blue	Nov.-06
23	Ziegler, Emanuel	Germany-HD	SPH MHD, large scale, Lagrange	Bartelmann	Blue	

Red	New IMPRS member from external application
Green	IMPRS "Quereinsteiger", arrival WS 2005/06
Blue	IMPRS "Quereinsteiger", arrival SS 2006



IMPRS positions:

--> internal (IMPRS) and external funding



IMPRS & other people :



IMPRS staff:

- **Spokespersons:** Hans-Walter Rix (MPIs), Stefan Wagner (ZAH)
- **Coordinator:** Christian Fendt
- **Committee:** 5 institute representatives & 5 deputies, decision making, evaluates applications
- **Student representatives:** Steve Boudreault, Giulia Vannoni
- **(Lecturers:** do lecturing within IMPRS programme, ie courses in English))
- **Thesis committee:** 3 scientists: supervisor + 2 others “supervising supervision” suggested by your supervisors (by you), approved by IMPRS committee

Department of Physics & Astronomy (Faculty):

- **Dean:** Prof. M. Bartelmann (ITA), makes decisions
- **Faculty office:** Dr. Ostrowski & secretary (admission PhD student), general queries
- **PhD committee** (“Promotionsausschuß2): evaluates PhD applicants, advises Dean
- **PhD examination board** (“Prüfungsausschuß”): approves PhD thesis
- **PhD thesis referees** (“Gutachter”): evaluate PhD thesis
- **PhD examiner** (“Prüfungskommittee”): evaluate final PhD disputation

IMPRS PhD program:



A) PhD degree

PhD in astronomy ---> astronomy program for PhD study

PhD in physics ---> physics is not PhD study;
obligation to follow HD university graduate program

--> Same doctoral degree: **Dr. rer. nat.** granted by **HD university**

--> Additional **IMPRS certificate** about PhD study / program

B) IMPRS students <---> non-IMPRS students

IMPRS: **course attendance** mandatory (if not already taken)

IMPRS seminar, IMPRS summer schools

final **IMPRS certificate**

No regular exams (so far... see Bologna process) --> final **doctoral disputation** (oral)

course exams voluntary depending on student & lecturer --> IMPRS certificate

IMPRS courses open to all students

C) Mandatory courses for PhD within Uni / IMPRS Heidelberg:

--> dissertation in astronomy **(a)** or physics **(p)**

1) Basic courses:

- (a,p)** - [Introduction to astronomy and astrophysics I + II](#) (block course, Sep 2006)
- (a,p)** - [Theoretical astrophysics](#) (semester course, winter 2006)
- (a)** - Astronomy lab course, "Astronomisches Praktikum" (twice / year, before the semester)

2) PhD courses **(a)** :

- [Observational methods](#) (semester course, winter 2006, 2008)
- [Stellar astronomy & astrophysics](#) (semester course, summer 2007)
- [Galaxies](#) (semester course, winter 2007)
- [Cosmology](#) (semester course, summer 2008)

3) [Seminars](#): 1 seminar ("Seminar"), 1 advanced seminar ("Oberseminar"): [IMPRS seminar](#) **(a,p)**

4) [Teaching](#) obligation, "Lehrdeputat" **(a,p)**

IMPRS curriculum (PhD study astronomy)

A) Introductory (basic) courses (yearly basis):

--> phenomenology, concepts, key physics (Diplom/Master's)

1.) Introduction to Astronomy I + II:

--> basic concepts of classical astronomy – the Solar system – instruments & observational methods – the Sun & the stars -- star clusters & ISM

--> structure of the Milky Way – normal galaxies -- active galactic nuclei & radio galaxies – galaxy formation & evolution -- galaxy groups & clusters

2.) Theoretical Astrophysics:

--> radiation processes -- hydrodynamics -- plasma physics -- stellar dynamics
-- high energy astrophysics

3.) Astronomy lab course:

--> basic concepts, data reduction / statistical techniques & applications

IMPRS curriculum (PhD study astronomy)



B) Advanced courses: semester courses (PhD courses)

- 1.) **Observational methods** --> Observations in optical, IR, UV regime; radio & sub-mm astronomy -- Xray & gamma ray observations – high energy cosmic rays
- 2.) **Stellar astronomy & astrophysics** --> stellar structure & evolution telescopes – nuclear processes & elements – stellar atmospheres – formation of stars & planets – ISM
- 3.) **Galaxies** --> structure of the Milky way – morphology of galaxies & galaxy population -- formation & evolution of galaxies – active galactic nuclei – galaxy groups & clusters
- 4.) **Cosmology** --> models & properties of the homogenous universe – inhomogenities in the universe – early universe, inflation & dark energy – late universe, galaxy distribution, gas & galaxy clusters

IMPRS curriculum (PhD study astronomy)

C) IMPRS seminar:

1st year: Thursday seminar; student presentations: literature topics + own research

2nd & 3rd year: block seminar, retreat: research seminar

D) Accompanying program:

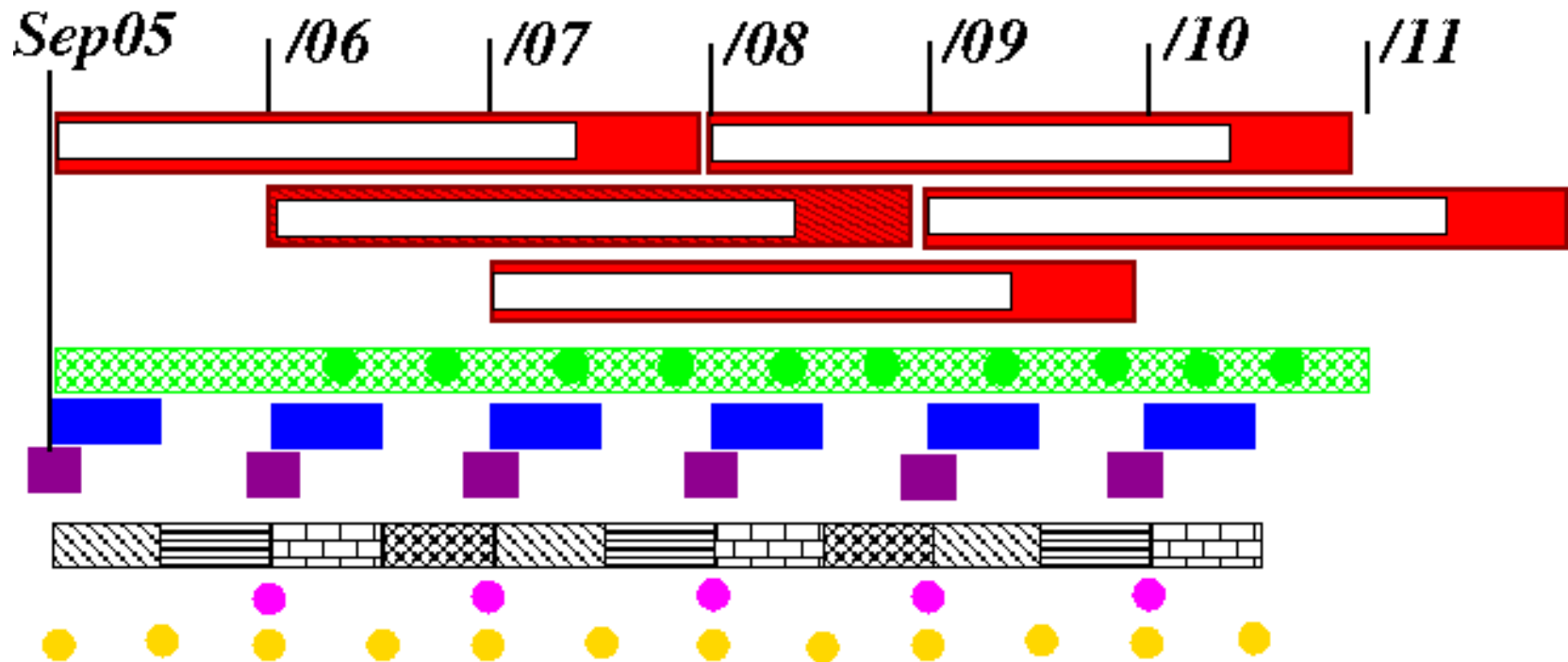
--> Summer schools (1 /year): general topic (2006: ISM); invited lecturers

--> German language course: **beginners course Monday/Friday 9:00 – 10:30 (at ARI)**



--> Soft skills course: presentation & communication skills

--> Travel support for conference / school visits

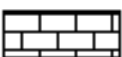



IMPRS curriculum:





Basics courses

-  *Introduction to Astronomy*
-  *Theoretical Astrophysics*

Advanced courses

-  *Observational Methods*
-  *Stellar Astronomy & Astrophysics*
-  *Galaxies*
-  *Cosmology*

IMPRS seminar

-  *Semester seminar (1st yr)*
-  *Block seminar (2nd, 3rd yr)*

Summer school

Practical exercises

IMPRS curriculum: winter term 2006



IMPRS Heidelberg course program 2006/2007							
	Time	Monday	Tuesday	Wednesday	Thursday	Friday	
Block courses:							
Sep. 25 – Oct.13, 2006	10 – 11	Introduction to Astronomy and Astrophysics I + II (lectures)					
	11 – 12						
	12 – 13						
	15 – 16	Introduction to Astronomy and Astrophysics I + II (exercises)					
	16 – 17						
Oct.02 – Oct.13, 2006	all day	Lab-course astronomy and astrophysics (at LSW)					
Semester courses:							
Oct.15, 2006 - Febr.15, 2007	09 – 10	German course 1a (University)	Theoretical			German course 1 (University)	
	10 – 11		Astrophysics (lect.)				
	11 – 12			German course 2 (MPIA) & Friday		Theoretical Astrophysics (lect.)	
	12 – 13						
	13 – 14	German course 3 (MPIK)	Theoretical		German course 1b ?? (MPIA)	German course 3 (MPIK)	German course 1b ?? (MPIA)
	14 – 15		Astrophysics (exerc.)				
	15 – 16		Observational				
	16 – 17		Methods				
	17 – 18		Astronomical			IMPRS Seminar	Physical Colloquium
18 – 19		Colloquium					

Mandatory IMPRS courses. Location: physics buildings at Philosophenweg/Albert-Ueberle-Strasse

Regular basic courses:	" Introduction to astronomy & astrophysics "	block course
	"Theoretical astrophysics "	semester course
Regular PhD courses:	" Galaxies " (in German)	Thu, 15:15-17:00 (lecture); exercises
	" Observational methods " (in English)	Tue, 15:15-17:00 (lecture); exercises
Advanced courses:	" Galaxy clusters "	Wed, 14:15-16:00
	" Interstellar dust "	Thu, 15:15-17:00
	" Substellar objects - extrasolar planets and brown dwarfs "	Tue, 15:15-17:00
	" Outflows and Jets: Theory and Observations "	Fri, 09:15-10:45
	" Observing the Big Bang "	Thu, 09:15-11:00
	" Statistical Methods in Astrophysics "	Thu, 11:15-13:00
	" Colloquium for particle physics, astrophysics & cosmology "	Tue, 17:15-19:00, equiv. to Astro Colloq
	" Celestial mechanics "	Tue, 09:15-11:00

Regular course lectures for PhD students; mandatory for IMPRS curriculum:
Stellar Astrophysics, Galaxies, Cosmology, Observational Methods (held in English as 2-year curriculum)

Advanced courses for PhD students: one advanced course mandatory for IMPRS curriculum



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Welcome to IMPRS Heidelberg !

Best wishes for your PhD project !