M2 ASEP Mention « Science de l'Univers et Technologies Spatiales » parcours « Astrophysique, Sciences de l'Espace, Planétologie »

Natalie Webb, David Mimoun

General

- A second year masters programme aimed at producing the next generation of PhD students in areas of astrophysics, planetary science and space sciences.
- Renowned both nationally and internationally
- Joint programme between the Toulouse III University and ISAE, with shared courses

General

Secretary (University Toulouse III) – Hélène Perea, office B123 at the Observatoire Midi-Pyrénées
E-mail: m2asep@irap.omp.eu or helene.perea@obs-mip.fr

Contact ISAE (rooms) – Sophie Marronnier, office 61-122 / Isidore Tardieu office 05-107

Responsible M2 ASEP (University Toulouse III) – Natalie Webb
Office J044, IRAP, Roche site : Natalie.Webb@irap.omp.eu

Responsible M2 ASEP (ISAE) - David Mimoun
David.Mimoun@isae.fr

M2 ASEP students (2023-2024)

<u>27 students from:</u>

14 : M1 SUTS, Toulouse III
5 : ISAE
2 : Other masters
6 : Spacemaster

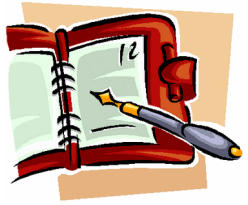
(some other students (Erasmus, etc) join us for some courses)

Bridging Courses
20 hrs from 1st September

Aimed at students who have not followed the M1 SUTS, but open to all

Lectures

6 h Extragalactic astrophysics and cosmology
4 h Physics of space plasma
4 h Astroparticle physics
6 h Stellar physics



Planning : agenda on line via the M2 ASEP web page
http://www.obs-mip.fr/asep

Course organisation
From 5th September to 20th December

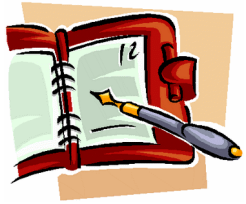
Lectures

– 7 general physics and astrophysics courses (7x20h, 15 ECTS)
– 4 transversal courses shared with M2 TSI (9 ECTS)
– 5 options, 3 to be chosen

No two courses held at the same time, all options can be followed for interest.

– Seminars for M2 ASEP students

Planning : agenda on line via the M2 ASEP web page
http://www.obs-mip.fr/asep



Core courses

UE : K5SUAE – Physics & astrophysics (15 ECTS)

- **KSUA9AA1** – Radiative processes and radiative transfer (F. Paletou, L. Tibaldo) – 20h
- **KSUA9AA2** – Gravitation (B. Lamine) – 20 h
- **KSUA9AA3** – Fluid dynamics (M. Rieutord) – 20 h
- **KSUA9AA4** – Space plasma physics (G. Fruit, V. Genot) – 20h
- **KSUA9AA5** – Formation and evolution of planetary systems (C. Baruteau, G. Quitté, J. Lasue) 20 h
- **KSUA9AA6** – Stellar physics (F. Paletou, L. Jouve) 20 h
- **KSUA9AA7** – Extragalactic astrophysics and cosmology (G. Soucail, A. Blanchard) 20h

With ISAE students

Practical work to be done in pairs

UE : K5SUAE – Transversal courses (9 ECTS)

- **KSUX9AC1** – Instrumentation for astrophysics (P. von Ballmoos, F. Boone) – 20h
- **KSUX9AC2** – Analysing data and images (H. Carfantan) – 6h
- **KSUX9AC3** — Advanced space mechanics (D. Mimoun) – 12h
- **KSUX9AC4** – Engineering systems (C. Benassy Foch) – 12h
- **KSUX9AV1** – Scientific English (N. Webb) – 24 h

With M2 TSI Technologies Spatiales et Instrumentation

UE : K5SUAE – Numerical simulations (3 ECTS)

KSUAAAA1 – Numerical simulations and data processing (H. Carfantan, D. Marshall) – 30h

Options

UE : K5SUAE – Astrophysics – the options : 3 modules to choose – 15h each (6 ECTS)

- **KSUA9AB1** – Interactions of planets with their environment (V. Genot)
- **KSUA9AB2** – The interstellar medium and stellar formation (C. Vastel, M. Rieutord)
- **KSUA9AB3** – Stellar and planetary sismology (S. Deheuvels)
- **KSUA9AB4** – Compact objects and accretion (O. Godet, S. Guillot)
- **KSUA9AB5** – Cosmology and galaxy physics (A. Blanchard, F. Boone, T. Contini)

Course organisation
From 5th September to 20th December

Masters seminars: Fridays at 10:45, Jules Verne room, OMP

AIM: provide a vision of current research in astrophysics, planetary science and space sciences in areas of research not covered in the lecture courses

Seminars are open to all, but are aimed at Masters level

– list on ASEP web site

IRAP seminars : alternate Thursday mornings at 11:00

See https://www.irap.omp.eu/calendrier-seminaires-irap/ for subject and room Attendance encouraged, when available

Exams : A couple of weeks after the end of each lecture course + exam week, first full week of January

Other meetings

« Foire aux stages » October 2023
« Serveur des stages » open 10th October 2023
Link on M2 ASEP webpages

Morning consecrated to python if enough interest
- for novice and intermediate users

Nov. 2023, Meeting on « Applying for a PhD »

November (if requested): Working outside of research & selling your skills acquired during the M2 ASEP to a future employer

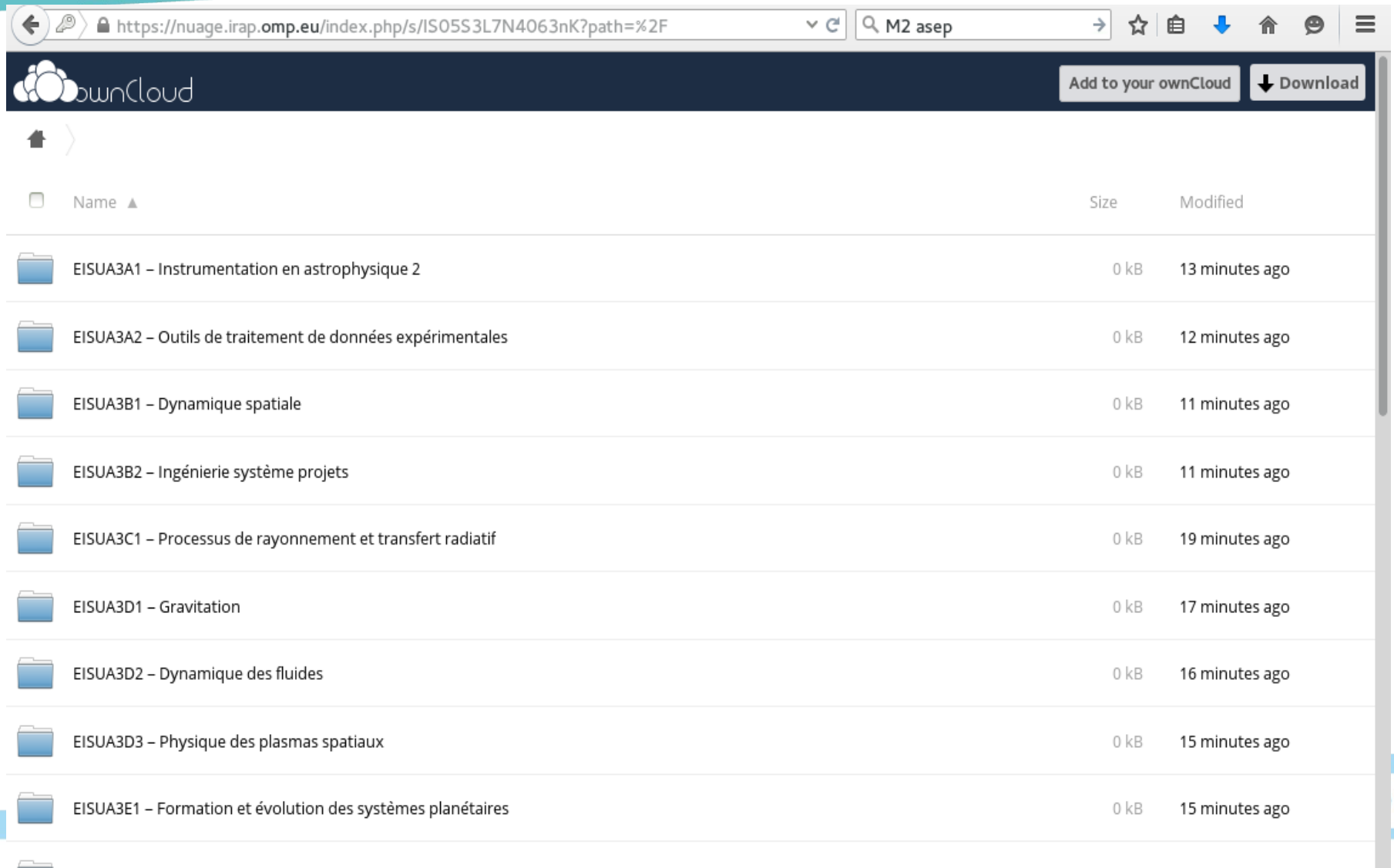
Workshops : Improving your CV and cover letter

General organisation

Location
Most courses take place at ISAE. The seminars take place at OMP.

As a Toulouse III M2 ASEP student you have certain rights on the ISAE campus :
- access to the ISAE site
- access to the canteen
- computer account

Owncloud – slides, problem sheets, info, etc



Other information

The OMP library

- Open to everyone, including students (Tuesday afternoons and Thursday mornings, 09:00-12:00 & 13:00-17:00). email: bibli@obs-mip.fr
- Books dedicated to M2 courses (list of books available and new books can be bought). For book requests email H. Péréa.
- 2 computers available to work on
- A course on using bibligraphic references is also proposed

Optional Practical classes : observing

At the Pic du Midi and remotely

Dates : 15-19 Jan. & 19-23 Jan.
4 nights (23-27. if bad weather)
Organiser : F. Pitout

Observations with the radio antenna with F. Boone

+ some possibility to observe remotely with IRIS – contact F. Pitout

Research internship

2nd semester (**5 months : 29th January – 29th June**)

National server for astrophysics internships : opens October 2023, see M2 ASEP webpages

Choices to be made by 15th December 2023.

Many possibilities in and out of Toulouse. Some possibilities abroad, but there is no funding available from the M2 ASEP.

Internship procedure:

- Project supervised by a researcher in a research institute
- Signed agreement between host institute and the University
- Scientific report to be submitted (~30 pages)

- Public oral presentation (15+7m) to a jury of 6 scientists
- Head of internships: **N. Webb**

After the M2 ASEP

About 60% of M2 ASEP students go on to do a PhD in Toulouse or elsewhere

Those that do not go on to do a PhD do:

- Work in industry (Thales, Airbus Defence & Space, ...)
- Move to teaching (CAPES, Agreg)
- Do a different M2
- Undertake astrophysics related outreach work
- ...

Some statistics

2009-2010: 23/24 students passed

2010-2011: 15/17 students passed

2011-2012: 15/17 students passed

2012-2013: 14/15 students passed

2013-2014: 10/13 students passed

2014-2015: 17/20 students passed

2015-2016: 19/20 students passed

2016-2017: 24/26 students passed

2017-2018: 16/17 students passed

2018-2019: 20/22 students passed

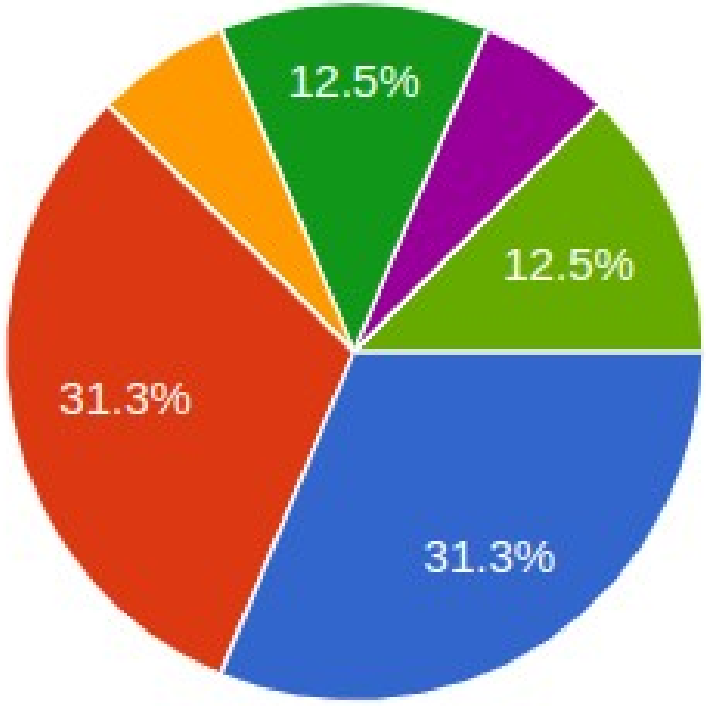
2019-2020: 18/19 students passed

2020-2021: 25/29 students passed

2021-2022: 26/27 students passed

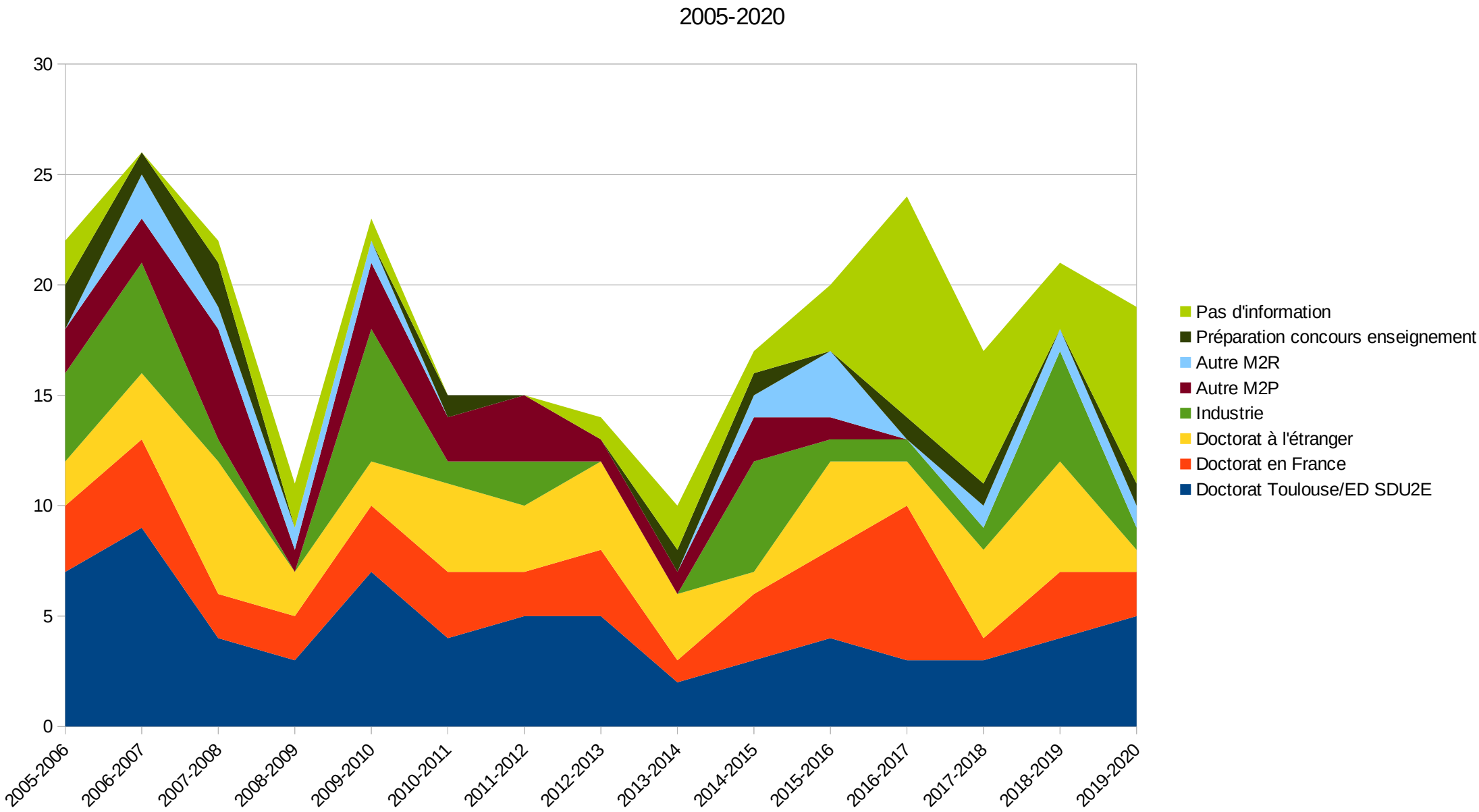
2022-2023: 24/26 students passed

What students did (from 2022-2023, provisory)



- PhD in Toulouse
- PhD elsewhere in France
- PhD elsewhere in the world
- Working in industry
- Undertaking another M2
- Going into teaching
- Doing outreach work or similar
- Nothing for 2023-2024 yet
- Something else

Evolution year by year



SpaceMaster : joint European Master in Space Science and Technology

European Coordinator: University of Lulea, Sweden

6 partner universities, where one is University Toulouse III (Paul Sabatier)

Education and Culture

Erasmus Mundus

SpaceMaster : joint European Master in Space Science and Technology

European Coordinator: University of Lulea, Sweden

6 partner universities, where one is University Toulouse III (Paul Sabatier)

First year (M1):

1st year at LTU (Kiruna, Sweden)

2nd year (M2):

One of the 6 partner universities. 6 students have chosen the M2 ASEP and 6 students have chosen the M2 TSI this year

Education and Culture

Erasmus Mundus