

MHD van astrofysische plasma's

Faculteit: Faculteit Natuur- en Sterrenkunde

ECTS-punten: 7.5 **Categorie:**M **Cursuscode:** NS-AP430M **Periode:** 30-08-2004 t/m 04-02-2005
(PER1-PER2)

Toegangseisen: .

Veronderstelde voorkennis: Basic knowledge of electrostatics and quantum mechanics

Voertaal: English

Inhoud:

The two large applications of plasma physics, research of laboratory plasmas (nuclear fusion) and of astrophysical plasmas (Sun, magnetospheres, stellar coronae, pulsars, etc.), are described from the single point of view of magnetohydrodynamics (MHD). This yields effective methods and insights for the interpretation of plasma phenomena on all scales, from the laboratory to the Universe. It equips the student with the necessary tools to understand the complexities of plasma dynamics in extended magnetic structures.

The following topics are treated: Elements of plasma physics (motion of charged particles, collective interactions, fluid description); Model of magnetohydrodynamics (description of laboratory and astrophysical plasmas from one viewpoint); Spectral theory (dynamics of homogeneous plasmas, equilibrium, waves and instabilities of inhomogeneous plasmas); Magnetic structures (tokamak, Sun, planetary magnetospheres, heliosphere, stellar winds, pulsars, accretion disks and jets); Introduction to computational MHD (discretisation techniques, simulations); Non-linear dynamics (streaming plasmas, shocks).

Contactpersoon: prof. dr. R.J. Rutten

Docent(-en): prof.dr.ir. J.P. Goedbloed
Bereikbaarheid:
 tel.: 030 6096999, e-mail: goedbloed@rijnh.nl
 dr. R. Keppens
Bereikbaarheid:
 tel.: 030 6096941, e-mail: keppens@rijnh.nl

Inschrijven via OSIRIS Online mogelijk: Ja

Inschrijven voor bijvakkers mogelijk: Ja

Werkvorm	Blok	Groep	Rooster			Gebouw	Zaal
Hoorcollege	PER1	1	08-09-2004 t/m 03-11-2004	Woensdag	11.00 - 13.00	MIN	211
	PER2	1	17-11-2004 t/m 26-01-2005	Woensdag	11.00 - 13.00	MIN	211
Practicum	PER1	1	08-09-2004 t/m 03-11-2004	Woensdag	13.00 - 17.00	MIN	022 (N&S)
		PER2	1	05-01-2005 t/m 26-01-2005	Woensdag	13.00 - 17.00	MIN (N&S)
				17-11-2004 t/m 15-12-2004	Woensdag	13.00 - 17.00	MIN (N&S)

Toets	Blok	Gelegenheid	Rooster			Gebouw	Zaal
Tentamen	PER2	1					
Tentamen	PER3	2					

Toelichting: **Beoordeling:**
Tentamen
 Compulsory coursework: students have to attend at least 80% of both lectures and practicals. There will be one intermediate test on the exercise material and one final test on all material.

Verplicht materiaal: **Boek**
 J.P. Goedbloed and S. Poedts, "Principles of Magnetohydrodynamics, with applications to Laboratory and Astrophysical Plasmas", Cambridge University Press (2004); ISBN: 0 521 62607 2. This new book contains all material (and more) for the course.