UNIVERSITÀ
DEGLI STUDI DI TRIESTE

Sezione Ricerca e Dottorati

Ripartizione Dottorati

LAST REVISED 14/10/2010

DOCTORAL SCHOOL IN ENVIRONMENTAL AND INDUSTRIAL FLUID MECHANICS

GENERAL DESCRIPTION

SUBJECT AREAS:
- main area: ICAR/01
- other areas: INF/01, MAT/07, MAT/05, MAT/08; ING-IND/06;ICAR/01;GEO/12

RESEARCH FIELDS:
1. Three-dimensional turbulence
2. Fluid mechanics in biological systems
3. Fluid mechanics in industrial processes and technological systems
4. Mathematical methods and modeling in fluid mechanics
5. Environmental large scale flows

ORGANIZING DEPARTMENT: Dip. di Matematica e Informatica

FOREIGN PARTNER UNIVERSITIES:
- Univerza V Novi Gorici (SLO)
- Università di Zagabria (HR)

OTHER PARTICIPATING INSTITUTIONS (Italian):
- OSMER ARPA-FVG
- Istituto Nazionale di Oceanografia e Geofisica Sperimentale (INOGS)
- Istituto Scienze Marine (ISMAR-CNR)
- International Center for Theoretical Physics (ICTP)

DURATION: 3 years

MAXIMUM NUMBER OF MONTHS TO BE SPENT ABROAD: 12

OFFICIAL LANGUAGE OF THE SCHOOL: English

ADMISSION INFORMATION AND REQUIREMENTS

NUMBER OF PLACES AVAILABLE: **6**

- SCHOLARSHIPS: 5
  - FUNDING BODY/IES:
    - Università degli Studi di Trieste 2
    - MIUR "Fondo Giovani Ricercatori" (Project title: *"Hi-resolution modelization of multiphase flows with heat transfer"*) 1
      N.B: This scholarship does not provide extra funding for periods of study abroad within the duration of the doctorate, unless the organizing Department decides to make these funds available.
    - Dept. Matematica e informatica International (grant from Centre for Theoretical Physics (ICTP) Project title: "*Modelling of precipitation and cloud process in climate models*")....1
      N.B: This scholarship does not provide extra funding for periods of study abroad within the duration of the doctorate, unless the organizing Department decides to make these funds available.
    - Dept. Matematica e informatica International (grant from Istituto Nazionale di Oceanografia e Geofisica Sperimentale (OGS) (Project title: "*Physical oceanography*")....1
      N.B: This scholarship does not provide extra funding for periods of study abroad within the duration of the doctorate, unless the organizing Department decides to make these funds available.

Candidates who accept an earmarked scholarship are committed to the pre-assigned topic

Candidates have to list (in order of preference) which scholarships they apply for in the comments

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box at the bottom of the "qualifications evaluation form". If extra earmarked scholarships become available after candidates have completed their application, they can modify their preference list within the deadline for receiving certificates.

NON-FUNDED PLACES:

grant-holders funded by the Italian Ministry of Foreign Affairs permitted to sit the entrance examination in the country of origin **1**

ACADEMIC QUALIFICATION REQUIRED: see Announcement (art. 1.1 - Requirements)

DEADLINE FOR COMPLETION OF DEGREE: 16.12.2010

ASSESSMENT CRITERIA: Qualifications

FINAL SCORE:..... 100/100

MINIMUM FINAL SCORE REQUIRED: 60/100

QUALIFICATIONS REQUIRED/RELATIVE WEIGHT:

Art. 11 Announcement: all candidates are required to present the following documents, regardless of whether or not a score is assigned to them (see below):

1. a detailed curriculum vitae et studiorum: 10/100
2. applicants who have been awarded a degree outside Italy are requested to present only an extended summary of the degree thesis either in English or in Italian if the thesis has been written in languages other than English or Italian. The Board will especially take into consideration the degree score: 40/100
3. academic qualification with the transcript of the exams and scores, plus the degree score: 20/100
4. letters of recommendation: 10/100
5. the motivations for enrolling to the programme: 10/100
6. Certificate GRE: 5/100
7. Others: 5/100
8. Qualifications Evaluation Form (unless this form is presented, qualifications and publications CANNOT be assessed by the Examining Board)

MINIMUM SCORE REQUIRED FOR QUALIFICATIONS/PUBLICATIONS: 60/100

ABSOLUTE DEADLINE FOR RECEIVING CERTIFICATES: 20.12.2010 by midnight CET (GMT+1)

ADDRESS TO WHICH CERTIFICATES SHOULD BE SENT: Segreteria del Dipartimento di Matematica e Informatica, Via Valerio 12/1 – 34127 Trieste or else by e-mail to: dsmamm@univ.trieste.it

CONTACT INFORMATION

DIRECTOR OF THE SCHOOL: Prof. Vincenzo Armenio - Dipartimento di Ingegneria civile e ambientale- Università degli Studi di Trieste - tel. 040/5583472 fax 040/572082 e-mail armenio@dica.units.it

VICE-DIRECTOR: Prof. Alfredo Bellen - Dipartimento di Matematica e Informatica - Università degli Studi di Trieste - tel.040/558.2608; fax 040/558.2636 e-mail bellen@units.it

WEB SITE: http://poseidon.ogs.trieste.it/phd/fluid

OVERVIEW: The mechanics of fluid flows is an important part of mechanics, it involves rather advanced physical phenomena, and has a broad range of applications. Most environmental systems involve the dynamics of water and gases that is described in terms of fluid mechanics. Similarly, biological systems are regulated by transport and dispersion of elements or species in water, air, and blood. Many industrial problems are concerned with fluid processes: for instance in transportation (automotive, aeronautic) applications, in processes where chemical-fluid dynamic Interaction is expected, and so on. This program is specifically interested in the processes involving motion of a fluid, and the related properties of advection, dispersion and mixing within the fluid itself. In evoking fluid mechanics, one has to think in a very broad sense, including large-scale and small-scale processes, transport phenomena at the relevant scales, interaction between a dissolved phase and the carrying fluid, and the possible effect of mixing and biological aspects. Moreover,

the extension of fluid dynamics to applicative purposes often involves interaction with nearby physical fields. Thermodynamics and microphysics of the large-scale processes, as well as interaction between fluids and solid elements are therefore part of the program.
In order to be more specific, and following the expertise of the participants to the program, the following research fields are considered:

1. Planetary and environmental large scale flows;
2. Three-dimensional turbulence;
3. Fluid mechanics in biological systems.
4. Fluid mechanics in industrial processes and technological systems
5. Mathematical methods and modeling in fluid mechanics.

CHANGES SUBSEQUENT TO 08.10.10

N.B: the original announcement may be subject to continuous modification. Any changes made subsequent to the original date of publication are listed below :

- 1st addition:
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IN PRESS

N.B: the following additions/changes have been requested by the organisers of the Doctorate and will be made official with an supplement to the:

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