



**Osaka University**

Graduate School of Engineering  
Department of Naval Architecture & Ocean Engineering

# Hydro-Seminar

by Lab. of Floating-Body Dynamics in Waves

You are cordially invited to a half-day Hydro-Seminar jointly organized  
by KFR (Kansai Fluid Research group) in the Kansai Branch of  
the Japan Society of Naval Architects and Ocean Engineers

The speaker in the Seminar is

**Professor Bernard Molin**

Ecole Centrale Marseille  
13 451 Marseille cedex 20, France

**Date:** Wednesday, 13 January, 2010  
**Time:** 14:30 – 17:00 (with break in the middle)  
**Venue:** Library Hall of Science and Engineering Library  
Suita Campus, Osaka University  
[http://suita.library.osaka-u.ac.jp/intro\\_access.html](http://suita.library.osaka-u.ac.jp/intro_access.html)

## Brief Schedule

14:30 – 15:30	<b>Topic (1): <i>Hydrodynamic modelling of perforated structures</i></b>
15:30 – 15:45	Break
15:45 – 16:45	<b>Topic (2): <i>Moonpool and gap resonances</i></b>
17:00 –	Friendship Party at SAWARABI Restaurant

## Abstract

### *Hydrodynamic modelling of perforated structures*

There are many instances of perforated structures in offshore and coastal engineering: Jarlan walls, stabilizers for compliant towers, progressive wave absorbers, wellhead protection covers, mudmats, etc. The size and shape of the openings are such that the flow separates with the consequence that the pressure drop cannot be linearly related to the traversing velocity. It will be shown that the hydrodynamic performance of these structures can be modelled within potential flow theory by assuming, from the start, a quadratic discharge law. Numerous examples will be given, with comparisons between numerical and experimental results.

### *Moonpool and gap resonances*

There is much need, within the offshore and shipping industries, for validated tools to compute the water motion inside moonpools or in the gaps in-between side-by-side hulls. This is necessary for marine operations and for the design of hawser/fendering systems. First it will be presented how approximate values of the resonant frequencies can be derived. Then some experimental investigations on the viscous damping of this resonant free surface motion will be presented. Finally the lid with quadratic damping technique as implemented within the Diodore software will be introduced and validated against experimental results.



## The Speaker



Professor Bernard Molin graduated from Ecole Polytechnique of Paris in 1974, obtained his Master of Science in Naval Architecture from University of California – Berkeley in 1975, and Doctor of Engineering from ENSM Nantes in 1981. He was awarded the ‘Habilitation à Diriger les Recherches’ by Aix-Marseille II in 1996. Professor Molin was Project Manager of IFP project ‘Hydrodynamics of Structures at Sea’ during 1982 to 1994, Professor at the Ocean Engineering Department of ‘Ecole Supérieure d’Ingénieurs de Marseille’ (ESIM) during 1994 to 2004. He has been Scientific Advisor at Principia R.D. from 1994.

Professor Molin’s research activities have been mainly concerned with nonlinear hydrodynamics (drift forces, slow drift motion, high frequency loads and response), and development of computer models for the French offshore industry. Recent involvement has included hydrodynamics of perforated structures, Vortex Induced Vibrations, slamming, moon-pool resonances, hydroelastic responses, sloshing in tanks and motion coupling, run-up effects and slow-drift excitation. Professor Molin was 22nd Georg Weinblum Memorial Lecturer (1999-2000), In charge of ‘Groupe de compétences Hydrodynamique’ of CLAROM (1998-on), and in-charge of the ‘Comité scientifique’ of GIS-HYDRO (2000-on).

## Map near the Venue



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