



# Lectures on Semi-Classical Analysis in Himeji

Various applications of the FBI-transform  
in quantum mechanics:  
A. Martinez (Bologna)

Propagation of Coherent States in  
Quantum Mechanics: D. Robert (Nantes)

On the Born-Oppenheimer approximation:  
V. Sordani (Bologna)

High frequency analysis of the Helmholtz  
equation: X.P. Wang (Nantes)

2006年 9月 7, 8日(木,金)

7日 イーグレ姫路 4Fセミナー室A

8日 兵庫県立大学書写キャンパス記念会館  
会場・プログラム・講義概要・問い合わせ

<http://www.sci.u-hyogo.ac.jp/news/announce.pdf>

準古典解析入門

# Lectures on Semi-Classical Analysis in Himeji

今秋姫路におきまして、André MARTINEZ (Bologna), Didier ROBERT (Nantes), Vania SORDONI (Bologna), Xue Ping WANG (Nantes) の各氏をお招きして、準古典解析の理論およびその応用について、入門的な講義をして頂く予定です。

日時・会場、プログラム、講義題目・概要を以下にご案内致します。多数の方々の御参加をお待ちしております。

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藤家雪朗

## 日時・会場

9月7日(木) イーグレ姫路セミナー室A (姫路駅徒歩10分)

<http://www1.winknet.ne.jp/~egret-himeji/>

9月8日(金) 兵庫県立大学書写キャンパス記念会館ホール

[http://www.eng.u-hyogo.ac.jp/info/guide/fs\\_access.html](http://www.eng.u-hyogo.ac.jp/info/guide/fs_access.html)

## プログラム

9月7日(木)

10:00 – 10:50 V. Sordoni

11:10 – 12:00 V. Sordoni

13:20 – 14:20 A. Martinez

14:30 – 15:30 A. Martinez

15:50 – 16:50 V. Sordoni

9月8日(金)

10:00 – 11:00 V. Sordoni

11:10 – 12:10 A. Martinez

13:20 – 14:20 A. Martinez

14:35 – 15:35 D. Robert

15:50 – 16:50 X. P. Wang

初日9月7日(木)の晩に講師の方々を囲んで懇親会を開くことに致しました。是非ご参加下さい。尚、ご出席下さる方は8月31日までに藤家までご一報頂けると幸いです。

## 講義題目・概要

### **Martinez, André**

Title: Various applications of the FBI-transform in quantum mechanics

Abstract: We introduce the (semiclassical) Bargman-FBI transform and review several applications of it. In particular: Sjöstrand's theory of microlocal analytic singularities; Estimates on the microlocal tunneling effect (including microlocal WKB asymptotics); Adiabatic estimates; Analytic smoothing effects of the Shroedinger equation.

### **Robert, Didier**

Title: Propagation of Coherent States in Quantum Mechanics.

Abstract: We present the basic properties of the Gaussian coherent states and explain the construction of asymptotic solutions for Schrödinger equations. We put emphasis on accurate estimates of these asymptotic solutions: large time, analytic or Gevrey semi-classical estimates. We also give applications to propagation of frequency set (analytic and Gevrey) and to semi-classical estimates for bound states.

### **Sordoni, Vania**

Title: On the Born-Oppenheimer approximation

Abstract: We apply various microlocal techniques (Grushin problem, pseudodifferential calculus) to the study of the Born-Oppenheimer approximation for N-body quantum systems. In particular, we obtain asymptotics of the spectrum of molecules, as well as a reduction of the total quantum evolution group to that of an effective Hamiltonian (both for smooth interactions and Coulomb-type ones).

### **Wang, Xue Ping**

Title: High frequency analysis of the Helmholtz equation

Abstract: This talk is concerned with the semi-classical analysis by Wigner's approach of the Helmholtz equation with a source term having concentration or concentration-oscillation phenomena. We will recall basic properties of Wigner transform and semi-classical measures and show that the tools from semi-classical scattering theory, in particular, some modified Robert-Tamura type estimates, are powerful in this kind of problems.