Conference

SPECTRAL THEORY AND ITS APPLICATIONS

October, 3, 2012 - October, 5, 2012

Institute of Mathematics of Bordeaux
University Bordeaux 1

CONTENTS

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ACKNOWLEDGEMENTS

1. Location, registration, computer access, lodging and reimbursement information

The conference takes place at the Institute of Mathematics of Bordeaux (= IMB, for short). The Institute is located at Building A33, see Section 7, Figure 1.

The talks will be given at the Conference Auditorium of IMB (= 'Salle des Conférences' in French) located on the first floor right to the left after the entrance to IMB and Room 1 (= 'Salle 1' in French) situated on the first floor of IMB a dozen of meters further with respect to the Conference Auditorium (on the opposite side of the elevator/staircase landing). The Conference Auditorium and Room 1 of IMB are abbreviated as "SdC" and "S1", respectively.

Coffee breaks will take place in the Coffee Lounge of IMB, located on the first floor of IMB (take the corridor to the right after the entrance).

The REGISTRATION of the participants will take place on October, 3, 2012, at the Coffee Lounge of IMB from 11:00 to 12:30. During the registration, participants will be asked to provide the following information.

- The hotel he (she) stays in (for inner accountance issues),
- If he (she) will take part in the Conference Dinner (to be held on the evening of October, 4, 2012; see Section 6 for more details). The dinner fee is 15€ per person (please have the exact amount in cash).

WIFI-COMPUTER ACCESS: the participants of the conference will get a UNIX account for the duration of the event. Your personal login and password is inserted inside your conference badge.

To get the Wi-Fi access on your laptop computer, please start your web browser and click on "Accept" button on its capturing screen. This will bring you to a screen with a sort of login form; please choose "Université Bordeaux 1" session , enter your login/password and proceed as usually.

You can also directly login to IMB terminals located at Room 151 (it is on a half-way from the Conference Room to the Coffee Lounge); the door to the room will be kept open.

If you agreed in advance with the organizers of the conference on the reimbursement of your LODGING expenses, please take care to send (or hand) them your bill of the hotel. The bill should mention your surname, the dates of your stay and the amount payed. To speed up the reimbursement procedure, it seems to be a good idea to hand the bill to organizers prior to your departure.

If you ask for a REIMBURSEMENT, you are required to provide the following data (if this has not done yet):

- Name, surname,
- The date and the place of birth,
- Citizenship (if French one, please also give your social security number),
- Your university address,
- Your personal address,
- Your bank account coordinates (the name and the address of your bank, IBAN(= your international bank account number) and SWIFT code; a RIB for participants from France is perfectly ok).

2. Program

NB: The indicated laps of time for the talks include questions and a 5 minute break.

Wednesday, October, 3.	
11:00-12:30	Registration, Coffee Lounge.
12:30-14:00	Lunch.
Chairman: I. Veselić, SdC	
14:00-15:00	L. Pastur, SdC On Links Between Random Operator and Random Matrix Theories
15:00-15:30	W. Spitzer, SdC Anderson Orthogonality Catastrophe
15:30-16:00	Coffee break.
16:00-17:00	A. Rouault, SdC Sum rules seen by a probabilist
17:00-17:30	O. Post, SdC Boundary pairs and abstract Dirichlet-to-Neumann operators
17:30-18:00	A. Kutsenko, SdC Sharp spectral bands estimates for periodic vector-valued Jacobi operators

Thursday, October, 4.	
Chairmen: L. Pastur, SdC; E. Amar, S1	
9:00-10:00	I. Veselić, SdC Equidistribution properties of PDE-eigenfunctions
10:00-10:30	N. Peyerimhoff, SdC A Wegner estimate and localisation for alloy-type models with sign-changing exponentially decaying single-site potentials
10:30-11:00	Coffee break.
11:00-12:00	P. Kurasov, SdC Magnetic field and inverse problems for quantum graphs
12:00-12:30	C. Schumacher, SdC Lifshitz behaviour of the IDS of Schrödinger operators with non-negative random poten- tials
12:30-14:00	Lunch.
Chairmen: P. Kurasov, SdC; A. Rouault, S1	
14:00-15:00	S. Naboko, SdC The estimates of decay of eigenvectors and generalized eigenvectors of Jacobi Matrices with a gap in the essential spectrum
15:00-15:30	M. Usman, SdC On some sharp spectral inequalities for Schrödinger operator on semi-axis
15:30-16:00	Coffee break.
16:00-16:30	N. Torki-Hamza, SdC Laplacians and Schrödinger operators on an infinite graph
16:30-17:00	F. Truc, SdC Scattering theory for graphs isomorphic to a homogeneous tree at infinity
17:00-17:30	M. Bonnefont, SdC Essential spectrum and Weyl estimates for Laplacians on in- finite graphs
20:00-22:00	Dîner de la conférence, restaurant "Au Cinéma d'Antan", see Section 7, Figures 2, 3.

Additional column entries (S1):

Time	S1 entry
12:00-12:30	D. Sambou, S1 Resonances near thresholds for Pauli and Dirac magnetic operators
16:00-16:30	A. Taarabt, S1 Equality of bulk and edge con- ductances in a localization re- gion and in the continuous set- ting
16:30-17:00	M. Derevyagin, S1 On the dynamics of the spec- trum of a family of Jacobi ma- trices generated by a CMV matrix
17:00-17:30	W.S. Li, S1 On inequalities for eigenvalues of sums of self-adjoint opera- tors

Friday, October, 5.	
Chairman: F. Barthe, SdC	
9:00-10:00	V. Georgescu, SdC On the boundary values of the resolvents of a class of self-adjoint operators on Krein spaces
10:00-10:30	C. Anné, SdC Spectrum in singular perturbation : the example of the Hodge Laplacian on partial collapsing
10:30-11:00	Coffee break.
11:00-11:30	M. Dimassi, SdC Spectral asymptotics for the Schrödinger operator with magnetic field
11:30-12:00	A. Mantile, SdC Artificial interface conditions in quantum transport models
12:00-13:30	Lunch.
Chairman: V. Georgescu, SdC	
13:30-14:30	F. Barthe, SdC Variants of the hypercontractivity theorem
14:30-15:00	P. Maheux, SdC Super Poincaré and Nash-type inequalities for Subordinated Semigroups
15:00-15:30	M. Arnaudon, SdC Negative curvature, Brownian motion and bounded harmonic functions

3. Abstracts of the talks

Colette Anné, Laboratoire de Mathematiques J. Leray, Nantes
Spectrum in singular perturbation : the example of the Hodge Laplacian on partial collapsing.

We study the limit spectrum of the Hodge-de Rham operator under the perturbation of collapsing one part of a manifold obtained by gluing together two manifolds with the same boundary. It appears to take place in the general problem of blowing-up conical singularities as introduced by Mazzeo and Rowlett.

Joint work with J. Takahashi

Marc Arnaudon, Université Bordeaux 1
Negative curvature, Brownian motion and bounded harmonic functions

It is well known that on a Riemannian manifold, there is a deep interplay between geometry, harmonic function theory, and the long-term behaviour of Brownian motion. Negative curvature amplifies the tendency of Brownian motion to exit compact sets and, if topologically possible, to wander out to infinity. On the other hand, non-trivial asymptotic properties of Brownian paths for large time correspond with non-trivial bounded harmonic functions on the manifold. We describe parts of this interplay in the case of negatively curved simply connected Riemannian manifolds. Recent results are related to known properties and old conjectures.

Franck Barthe, Université Toulouse 3
Variants of the hypercontractivity theorem

We will present hypercontractive estimates for various diffusion semigroups, especially when the invariant measure does not satisfy a log-Sobolev inequality. Then we will discuss the challenging problem of understanding the smoothing effect of the Ornstein-Uhlenbeck semigroup when the initial data is only assumed to be integrable, unlike in Nelson's theorem.

Michel Bonnefont, Université Bordeaux 1
Essential spectrum and Weyl estimates for Laplacians on infinite graphs

The goal of this talk is to investigate some spectral properties of discrete Laplacians. Our study is based on an Hardy inequality and the use of super harmonic functions. We recover and improve some lower bounds for the bottom of the spectrum and the essential spectrum and in some situation obtain Weyl asymptotics for the eigenvalues of the Laplacian.

We also provide a probabilistic representation of super-harmonic function and use coupling arguments to compare the bottom of the spectrum and the essential spectrum of some discrete Laplacians.

Joint work with S. Golénia

Maxim Derevyagin, TU Berlin, Germany
On the dynamics of the spectrum of a family of Jacobi matrices generated by a CMV matrix

It turns out that some problems of analysis, combinatorics, probability theory, and mechanics lead to an eigenvalue problem of the form

$$(L + \lambda M - xI)q = 0,$$

where L, M are tridiagonal matrices and λ, x are spectral parameters. We consider the case where $L^2 = I$ and $M^2 = I$. This case is closely related to orthogonal polynomials on the unit circle and CMV matrices in the sense that every CMV matrix $\mathcal{C}$ admits the factorization $\mathcal{C} = LM$. Roughly speaking, our main result is that we find the λ-dynamics of the spectrum of the Jacobi matrix $L + \lambda M$ by

means of simple algebraic tricks. Besides, our method gives us a way to understand how the measure is changing when λ varies. In particular, if we start with the CMV matrix $\mathcal{C} = LM$ corresponding to the Jacobi polynomials on the unit circle, then we get that the Jacobi matrix $L + \lambda M$ corresponds to recently discovered -1 Jacobi polynomials on the real line.

Mouez Dimassi, Université Bordeaux 1
Spectral asymptotics for the Schrödinger operator with magnetic field

In this talk, we consider Hamilonians of the following type:

$$H(h, B) = (D_x - By)^2 + D_y^2 + V(hx, hy),$$

where h and B are constants. We consider trace formulae of the operator $H(h, B)$ when $B = 1$, $h \searrow 0$ and $B \searrow infrty$, $h = 1$. We will also discuss the case $2d$ where $d > 1$.

Vladimir Georgescu, Université Cergy-Pontoise
On the boundary values of the resolvents of a class of self-adjoint operators on Krein spaces

This work is devoted to an extension of the commutator techniques from the Hilbert space to the Krein space setting.

Joint work with Dietrich Haefner and Christian Gérard.

Pavel Kurasov, Stockholm University, Sweden
Magnetic field and inverse problems for quantum graphs

Inverse problems for quantum graphs with cycles can be solved using spectral data dependent on the flux of the magnetic field through the cycles. The solution is not unique if the system possesses certain symmetries. Our goal is to analyze the influence of the vertex matching conditions on the unique solvability of the inverse problem.

Anton Kutsenko, Université Bordeaux 1
Sharp spectral bands estimates for periodic vector-valued Jacobi operators

For periodic Jacobi operators with matrix-valued coefficients we estimate the Lebesgue measure of the spectrum, in terms of "smallest" non-diagonal coefficients.

Wing Suet Li, Georgia Institute of Technology, USA
On inequalities for eigenvalues of sums of self-adjoint operators

Consider self-adjoint operators $A, B, C : \mathcal{H} \to \mathcal{H}$ on a finite-dimensional Hilbert space such that $A + B = C$. Let $\{\lambda_j(A)\}$, $\{\lambda_j(B)\}$, and $\{\lambda_j(C)\}$ be sequences of eigenvalues of A, B, and C counting multiplicity, arranged in decreasing order. In 1962, A. Horn conjectured that the relations of $\{\lambda_j(A)\}$, $\{\lambda_j(B)\}$, and $\{\lambda_j(C)\}$ can be characterized by a set of inequalities defined inductively. This problem was eventually solved by A. Klyachko and Knutson-Tao in the late 1990s. In this talk we will show that these inequalities are also valid for selfadjoint elements in a von Neumann II_1 factor. In addition we will talk about some of the open questions related to this recent development.

Joint work with H. Bercovici, B. Collins, K. Dykema, and D. Timotin.

Patrick Maheux, Université d'Orléans
Super Poincaré and Nash-type inequalities for Subordinated Semigroups

We prove that if a super Poincaré inequality is satisfied by an infinitesimal generator $-A$ of a symmetric contracting semigroup then it implies a corresponding super Poincaré inequality for $-g(A)$ with any Bernstein function g. We also study the converse statement. We deduce similar results for the Nash-type inequality. We provide several examples.

Andrea Mantile, Université de Reims
Artificial interface conditions in quantum transport models

In a recent collaboration with F. Nier and A.Faraj, it has been shown that a simple modification of the Laplacian through artificial interface conditions allows an alternative approach to the adiabatic evolution of quantum resonances. The use of this modified framework, may hopefully provide with effective equations for the non-linear dynamics of Schrödinger-Poisson systems in the regime of quantum wells in a semiclassical island.

In this perspective, it is important to control the deformations effects introduced on the spectrum and on the time propagator by such interface conditions. In particular we are interested in uniform-in-time estimates of the perturbed semigroup. The main difficulty is due to the non-selfadjont character of our class of operators involving a lack of accretivity for the corresponding generator of the quantum dynamics. In this framework, a standard approach would only provide with finite-time estimates for the dynamical system. Our approach consists in constructing interwining operators leading to a dynamical comparison between the modified non-selfadjoint model and the corresponding 'physical' Hamiltonian.

Sergey Naboko, St.Petersburg State University, Russia
The estimates of decay of eigenvectors and generalized eigenvectors of Jacobi Matrices with a gap in the essential spectrum

Sharp estimates of eigenvectors and generalized eigenvectors of Jacobi Matrices associated with the spectral parameter lying in a gap in the essential spectrum to be discussed.The types of estimates for bounded and unbounded gaps are essentially different.Relation to the examples exhibiting the spectral phase transition of 2-nd kind is the second goal of the talk.

Joint work with J.Janas and G.Stolz

Leonid Pastur, Institute for Low Temperatures, Kharkov, Ukraine
On Links Between Random Operator and Random Matrix Theories

We present several families of selfadjoint ergodic operators for which we prove that their Integrated Density of States converges weakly as the parameter indexing operators of a given family tends to infinity to the infinite size limit of the Normalized Counting Measure of eigenvalues of certain random matrices. We then give an informal discussion of these results as possible indications of the presence of the continuous spectrum of the random ergodic operators belonging to considered families for sufficiently large values of the indexing parameters.

Norbert Peyerimhoff, Durham University, UK
A Wegner estimate and localisation for alloy-type models with sign-changing exponentially decaying single-site potentials

In this talk, we will consider Schrödinger operators on $\ell^2(\mathbb{Z})$ with a random potential of alloy-type.

The single site potential is exponentially decaying and allowed to be sign changing. The main aim is to prove a Wegner estimate, which is polynomial in the volume of the box and linear in the size of the energy interval. Our result generalises earlier ones obtained by Veselić. We will also briefly discuss an analogous statement in a continuous model. Our Wegner estimate is of a type which can be used for the multiscale analysis proof of Anderson localization in all energy regions, where the initial scale estimate holds. If time permits, we will give an outline of these arguments, as well. Concerning localisation, however, it should be mentioned that, recently, Krüger has obtained localisation results for a class of discrete alloy type models which includes ours.

Joint work with K. Leonhardt, M. Tautenhahn, and I. Veselić

Olaf Post, Durham University/Cardiff University, UK
Boundary pairs and abstract Dirichlet-to-Neumann operators

We present a concept for defining the Dirichlet-to-Neumann (DtN) operator in a purely functional-analytic framework starting with a closed form in a Hilbert space and a bounded operator from the form domain into an auxiliary Hilbert space. The basic example we have in mind is the energy form on a manifold with (possibly non-smooth) boundary. We present Krein-like resolvent formulas, spectral relations between the associated "Neumann"-Operator and the DtN operator and illustrate the ideas with many examples including Jacobi operators, Laplacians on manifolds with (non-smooth) boundary and the Zaremba problem.

Alain Rouault, Université Versailles-Saint-Quentin
Sum rules seen by a probabilist

Take a Hilbert space $\mathcal{H}$, a normal operator $\mathcal{N}$ and a fixed vector e, cyclic for $\mathcal{N}$. The main invariant of the unitary invariant class of $(\mathcal{H}, \mathcal{N}, e)$ is the spectral measure μ of the pair $(\mathcal{N}, e)$. In the self-adjoint (resp. unitary) case, other invariants are the Jacobi (resp. Verblunsky) parameters. Sum rules considered here are equalities between a functional of μ and a functional of these parameters. The most famous one is the Szegö's formula. We revisit these results in a probabilistic frame, viewing $\mathcal{N}$ as a random matrix of size $n \times n$ (in the GUE or the CUE ensemble for instance), e a fixed vector, and studying the asymptotic behaviour of the random measure μ in the regime of large n. Both sides of the sum rules are then expressions of the same action functional of large deviations, corresponding to two different encodings of μ. This frame allows an extension to matricial spectral measures.

Joint work with F. Gamboa

Diomba Sambou, Université Bordeaux 1
Resonances near thresholds for Pauli and Dirac magnetic operators

We consider the perturbations $H := H_0 + V$ and $D := D_0 + V$ of the free $3d$ Hamiltonians H_0 of Pauli and D_0 of Dirac with non-constant magnetic field, and V is a electric potential which decays superexponentially with respect to the variable along the magnetic field. The aim is to present some results on the distribution of resonances of H near the origin 0 and that of D near $\pm m$. In particular for a perturbation V of definite sign, we obtain informations on the distribution of eigenvalues of H (resp. D) near 0 (resp. near $\pm m$).

Christoph Schumacher, Technische Universität Chemnitz, Germany
Lifshitz behaviour of the IDS of Schrödinger operators with non-negative random potentials

The integrated density of states (IDS) of a random Schrödinger operator is in many instances known to exhibit Lifshitz tails at fluctuation boundaries. Usually the randomness enters the operator in a

monotone fashion, for example in alloy type models or breather models with repulsion. By using an inequality due to Thirring instead of Temple's inequality we can relax the monotonicity condition to a positivity condition. This includes all known previous examples and additionally enables us to deal with a new class of breather type potentials.

Joint work with I. Veselić.

Wolgang Spitzer, Fern Universität Hagen, Germany
Anderson Orthogonality Catastrophe

Let $-\Delta_L$ be the Dirichlet Laplacian on the interval $[-L, L]$ and let V be a potential with compact support. For $N \in \mathbb{N}$, let P_N and Π_N be the spectral projection of $-\Delta_L$ and of $H_L := -\Delta_L + V$ onto the first N lowest eigenfunctions, respectively. Then we consider the so-called Anderson integral

$$\mathcal{I}_{N,L} := \operatorname{tr} P_{N,L}(1 - \Pi_{N,L})$$

as N and L tend to infinity with the particle density $\rho := N/L$ being kept fixed. We prove that to leading order $\mathcal{I}_{N,L} = \gamma \log N$ as $N \to \infty$ with γ a positive constant that depends on the potential V and the density ρ. The proof uses Riesz's integral formula for spectral projections and Krein's resolvent formula. This is joint work with H. Küttler and P. Otte.

P.W. Anderson used this trace (with a rotationally symmetric and compactly supported potential V in $\mathbb{R}^3$) in 1967 to study the ground state transition probability of a system of N free fermions that is exposed to a sudden perturbation. Since then there has been a number of papers on this subject but no rigorous derivation yet.

Amal Taarabt, Université Cergy-Pontoise
Equality of bulk and edge conductances in a localization region and in the continuous setting

We shall consider the Hall and edge conductances associated to 2D-continuous model where the Fermi energy lies in localization region of the Bulk Hamiltonian. We prove their equality in the presence of an electric wall as well as of a magnetic one.

Nabila Torki-Hamza, Kairouan, Tunisia
Laplacians and Schrödinger operators on an infinite graph

We define Laplacians and Schrödinger operators on an infinite locally finite weighted graph. We would like to extend to infinite graphs some results about essential self-adjointness for such operators on Riemannian manifolds. We find that under some conditions, Schrödinger operators on infinite weighted graphs are essentially self-adjoint in the case of metrically complete graphs with bounded degree as well as for non complete ones.

Joint work with Y. Colin de Verdière and F. Truc

Françoise Truc, Institut Fourier, Grenoble, France
Scattering theory for graphs isomorphic to a homogeneous tree at infinity

The aim of this work is to describe in an explicit way the spectral theory of the adjacency operator on an infinite graph which, outside of a finite sub-graph looks like an homogeneous tree. We mainly adapt the case of the Schrödinger operators as presented in the book by Reed and Simon. We build generalised eigenfunctions for a Schrödinger operator with a compactly supported potential on a homogeneous tree, we define a deformed Fourier-Helgason transform and get a spectral decomposition of this operator. We deduce a similar spectral decomposition of any graph asymptotic to an homogeneous tree by proving the following combinatorial result : any such graph is isomorphic to a connected component of another graph so that the adjacency operator related to that graph is a finite

rank perturbation of that related to the homogeneous tree.

Joint work with Y. Colin de Verdière

Muhammad Usman, Université Bordeaux 1

On some sharp spectral inequalities for Schrödinger operator on semi-axis

We obtain sharp Lieb-Thirring inequalities for a matrix valued Schrödinger operator on semi-axis and show how they can be used to other related problems.

Ivan Veselić, Technische Universität Chemnitz, Germany

Equidistribution properties of PDE-eigenfunctions

In a joint paper with C. Rojas-Molina we have proven that eigenfunctions of the time-independent Schrödinger-equation on large cubes (with Dirichlet or periodic b.c.) exhibit a type of quantitative equidistribution property, which is uniformly good over arbitrary lenght scales. We present this result and discuss applications, extensions and open problems.

4. Participants

E. Amar,	U. Bordeaux 1
C. Anné,	U. Nantes
M. Arnaudon,	U. Bordeaux 1
C. Avicou,	U. Lyon 1
A. Bachelot,	U. Bordeaux 1
F. Barthe,	U. Toulouse 3
B. Bercu,	U. Bordeaux 1
M. Bonnefont,	U. Bordeaux 1
V. Bruneau,	U. Bordeaux 1
B. Chevreau,	U. Bordeaux 1
M. Derevyagin,	TU Berlin
M. Dimassi,	U. Bordeaux 1
C. Dubuisson,	U. Bordeaux 1
J. Fleckinger,	U. Toulouse 3
P. Fougères,	U. Toulouse 3
F. Gamboa,	U. Toulouse 3
V. Georgescu,	U. Cergy-Pontoise
S. Golénia,	U. Bordeaux 1
B. Haak,	U. Bordeaux 1
T. Jecko,	U. Cergy-Pontoise
K. Kellay,	U. Bordeaux 1
A. Kutsenko,	U. Bordeaux 1
S. Kupin,	U. Bordeaux 1
P. Kurasov,	U. Stockholm
W.S. Li,	Georgia Inst. of Tech.
P. Maheux,	U. Orléans
A. Mantile,	U. Reims
S. Naboko,	St. Petersburg Univ.
E.M. Ouhabaz,	U. Bordeaux 1
L. Pastur,	ILTPE
N. Peyerimhoff,	U. Durham
O. Post,	U. Durham
A. Rouault,	U. St. Quentin-Versailles
D. Sambou,	U. Bordeaux 1
C. Schumacher,	TU Chemnitz
W. Spitzer,	Fern Univ. Hagen
A. Taarabt,	U. Cergy-Pontoise
P. Thomas,	U. Toulouse 3
N. Torki-Hamza,	U. Kairouan, Tunisia
F. Truc,	Inst. Fourier
M. Usman,	U. Bordeaux 1
I. Veselic,	TU Chemnitz
M. Zarrabi,	U. Bordeaux 1

5. EVERYDAY MEALS

Starting from October, 3, the lunch for the participants of the conference is planned at the University restaurant "Haut-Carré" (= C1), see Section 7, Figure 1, for directions. The lunch is approx. 6.15€, and the participants are asked to pay it in cash at the cashier desk.

Besides that, there is a number of restaurants in the close neighborhood of IMB, see Section 7, Figure 1. For instance:

(C2) Café du 7-ème Art (traditional French cooking, 10-15€/a meal),
(C3) Les flots bleus (crêperie, 7-15€/a meal),
(C4) Croc' o' pain (sandwich shop, 3-5€/a sandwich),
(C5) Fac Kebab (Maghribian/Mediterranean style, 3-5€/(a very big) sandwich)
(C6) "48" (bakery-sandwich shop, 3-4€/a sandwich).

6. CONFERENCE DINNER

The conference dinner will take place on October, 4, from 20:00 to 22:00 at restaurant "Au Cinéma d'Antan" situated at 51, rue St. Rémi, Bordeaux. Please see Section 7, Figure 4 for more details.

Roughly speaking, the overall trip from the IMB to the restaurant takes approx. a half an hour; the walk from stop "Grand Théâtre" to the restaurant takes at most 10 min.

The price of the proposed menu is 30€ per person and we kindly ask for 15€ participation per person (to be given to the organizers during Registration; please have the exact amount in cash, see Section 1).

7. Appendix: maps, plans, etc.

Figure 1. A part of the campus of University Bordeaux 1; directions to get to the conference site (= IMB, Building A33) from the tram stops "Forum" (A), "Peixotto" (B).

Remarks:
- there is a misprint on the above figure - the right number of the IMB building is A33 (and not A32).
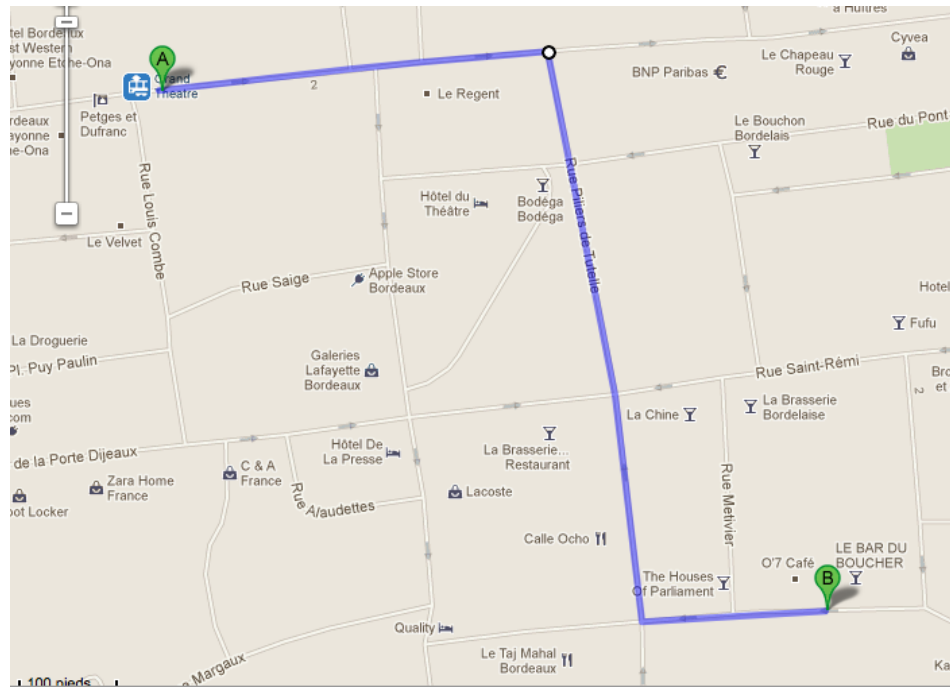- see Section 5 for abbreviations 'Cn'.

Figure 2. Conference dinner (October, 4, 2012, 20:00-22:00): directions for getting from tram stop "Grand Théâtre" (A) to restaurant "Le Parlement des Graves" (B).

More comments to Figure 2 - to get to the restaurant from the IMB please proceed as follows:

- take the tram (line B, direction 'Bassins à Flots/Claveau') at stop "Forum" (or "Peixotto"),
- step down from the tram at stop "Grand Théâtre",
- walk down 'le cours d'Intendance' for approximately 200 m.,
- turn right to 'la rue Pilliers de Tutelle', and walk another 200 m.

  You get to an intersection with an Indian restaurant "Taj Mahal" to your right. This isn't the place!!! It is rather a good orientation point.

- at this intersection, turn left and walk 50-100 m. on 'la rue Parlement-St. Catherine', restaurant "Le parlement des Graves " will be on your left.

  You've advanced too far if you get to 'la place du Parlement', the restaurant is then 30 m. backward.
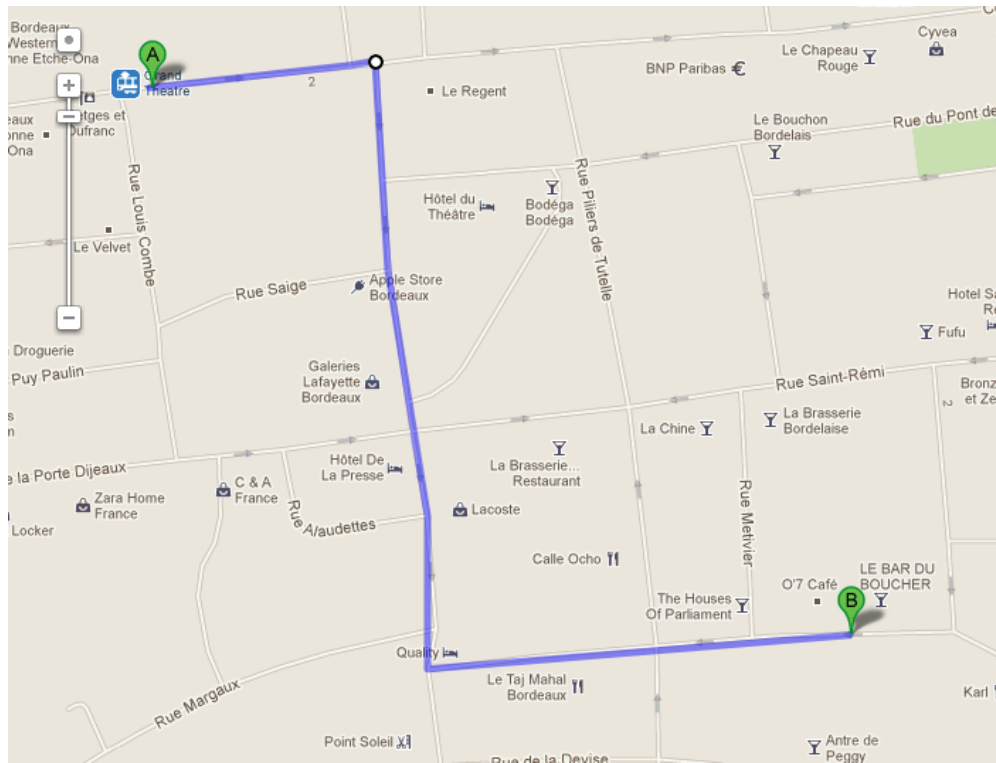
FIGURE 3. Conference dinner (October, 4, 2012, 20:00-22:00): an alternative (but equivalent!) way to get from tram stop "Grand Théâtre" (A) to restaurant "Le Parlement des Graves" (B).

The itinerary from Figure 3 is basically the same as on Figure 2, but it takes 'la rue St.Catherine' (the big shopping street crossing the downtown of Bordeaux) instead 'la rue Pilliers de Tutelle'.

Last minute update on the location of Conférence Dîner

A part of previously announced information on the conference dinner (suddenly) happened to be wrong and we apologize for inconveniences this might cause. Here is the update on the issue: the conference dinner will hold on Thu., October 4, 2012, from 20:00 to 22:00 (unchanged). The restaurant is "Au Cinéma d'Antan" located at 51, rue St. Rémi, Bordeaux.

On the demand of the restorator, the menu is unfortunatley unique:

- Starter: a piece of Cantal cheese and a salad with local countryside ham,
- Main course: duck magret with cep's cream and garnishement,
- Dessert: a little raspberry tart.

The wine/coffee is included in the meal.

Here are the directions to get to the restaurant:

- Take the tram (line B) to stop 'Grand Théâtre'.
- Walk down 'cours de l'Intendance' to the Grand Theater Square (approx. 250-300 m.),
- Turn right to 'rue St. Catherine' and walk another 100 m.,
- At the corner of "Galérie Lafayette" turn left to 'rue St. Rémi' (= 'rue de Porte Dijeaux') and walk 250-300 m. more; the restaurant will be on your left.
- Getting to the quay of Garonne river means that you walked much too far; please walk backward. Roughly speaking, the restaurant is about half-way between 'rue St. Catherine' and Garonne quay.
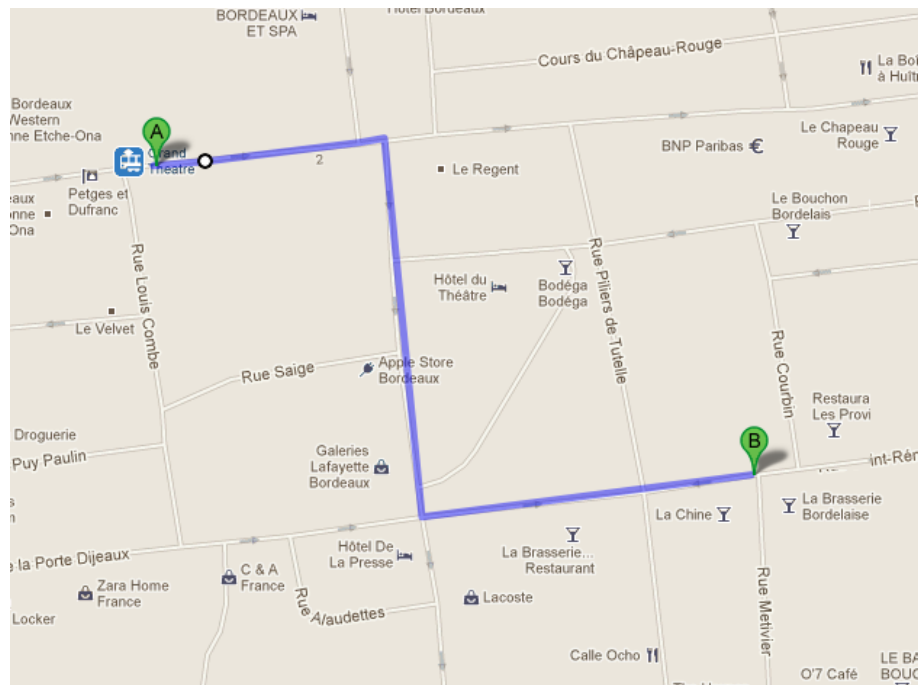
Please see the picture below.

FIGURE 4. Conference dinner (October, 4, 2012, 20:00-22:00): directions to get from tram stop "Grand Théâtre" (A) to restaurant "Au Cinéma d'Antan" (B).