SCHOOL :
« PROOF THEORY : LINEAR LOGIC, LUDICS, & GEOMETRY OF INTERACTION »

FOLLOWED BY A

CONFERENCE ON
« TRANSCENDENTAL SYNTAX : THE CONDITIONS OF POSSIBILITY OF LANGUAGE »

27 august – 1st september 2012
Paraty
(Rio de Janeiro state, Brazil)

Scientific commitee

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1 General scientific context

1.1 State of the art

At the beginning of the 20th century, Logic developed a foundational paradigm (Hilbert's program toward a *Proof theory*, [9]) whose aim was to *reduce* mathematics (and by transitivity, science, nay thought!) to a *combinatorics,* an algebra, of signs and words. In this foundational paradigm there was no *geometrical approach* and *computational interaction* was never considered.

As early as 1931, the incompleteness theorems of Gödel [7] exposed the strategic failure of this excessively ambitious theory, which then withdrew into its own taxonomic version of scientific knowledge – not to speak of human cognition.

The widespread low estimate of the value of this approach was revised upwards in the 1970s-1980s, due to its natural link – the notion of formal language – with *Computer Science*. And it was at this time that the works of Gentzen [2] threw off its foundationalist chains and a *second edition* of Proof Theory started: one stopped splitting hairs over "why" and focused on "how". The impact of this Proof Theory was striking.

- First, by incorporating the (anti-logicist in origin) *intuitionist* approach of Brouwer (contemporary with Hilbert's program), the attention to proofs normalization (Prawitz) and using the analogy between proofs and the *morphisms* of category theory – that is the *isomorphism of Curry-Howard* [10] – it gave mathematical status to functional programming (pure and typed lambda-calculus, Martin-Löf's constructive types theory, system F).
- Secondly, by diverting the categorical point of view from its original functional track, one got from there to Linear Logic [3] and with it the idea of the unique, unrepeatable *action* (a *"perfect"* action, to use a word coming from tenses grammatical classification): a first logical equivalent of the operationalism of Computer Science. That contrasts with the idea of the "*imperfect"* action, that is the mode of stable, durable – in a word, *perennial* – situations, hitherto the only ones considered in logic. The initial enthusiasm declined in the 1990s because the tools introduced proved not to be very effective. To give an example: Proof Theory had trouble in taking into account algorithmic complexity, and this is the case also for competing approaches (for example Finite Model Theory [8]). Even if Light Linear Logic (LLL) [4] opened a door in the direction of the study of algorithmic complexity, it was unable to do an adequate analysis of the infinite (or the *imperfect*, the perennial), of which complexity is the concrete computational trace.

These research trends in logic are based on the conviction that the logical reflection on Computer Science, and on other sciences, stalls because of its over-reliance on ideas which come from the beginning of the 20th century concerning: Finitism / infinitism, Syntax / semantics, Subject / object.

Indeed, after the incompleteness theorems, the foundational paradigm split. On one hand a professed *finitism* – the universe as it should be - , technically handled through the combinatorics of words; on the other hand, a pragmatic *infinitism* – the universe as it is (or rather, could be), handled through a wonderfully efficient tool, *set theory*. The original idea of a finite analysis of the infinite was thus reduced to a pure incantation. This schizophrenia

still persists in our days, since the category-theoretical paradigm didn't find enough strength in itself to find its own independent methods. Moreover, since finite combinatorics is part of it, we can say that set theory has reached the status of an insuperable foundational horizon. For the best, since set theory is a very convenient *unifying* tool, the equal temperament of mathematics… But also for the worse, since it is slightly out of tune, especially when we come to foundations, where something of the original ideal of the founding fathers, a sort of finitism (without the stubborn naivety attached to this word, the suffix "ism") is needed.
Logic *à l'ancienne* (Hilbert) eventually froze into an opposition **syntax/semantics** unable to express the dynamics at work in the "perfect" or to properly capture the phenomena of **complexity**. In the *cognitive* simplism of traditional logic, which influenced philosophy of science of 20th century and also the creation and first developments of computer science, the *subject* is opposed to the *object*, each in its place, once and for all, no argument. It is to this that 20th century science in the form of *quantum mechanics* has thumbed its nose: subject and object are *entangled*, the object only exists as the "negative" of the subject. In the same way, we have known since Gentzen [2] that – logically speaking – syntax and semantics are simply two partners in a game: this pleasing intuition was rediscovered in the 1990s, but it hasn't yet got the technical treatment it actually deserves.

1.2 A new foundational paradigm

In the last decade, propositions have been made for a new foundational paradigm going beyond the traditional model: beyond set theory, beyond the distinction syntax/semantics, beyond the distinction subject/object. This required imagination both at the mathematical and the philosophical level: since our natural representations, which rely too much on a sort of set-theoretic essentialism, will naturally reproduce set-theoretic patterns. Thus the relative import of philosophical issues in this mathematical research field, and the organization of the event in two parts : a purely technical one (centered around logical tools), followed by a more philosophical one (centered around the new foundational paradigm: Transcendental syntax).

1.2.1 Interaction : a central notion

*The keyword of this field, is the notion of **interaction**. Interaction naturally calls for linear logic, and its developments.*

Indeed, linear logic negation – as opposed to classical negation – expresses the exchange of partners in an interaction. More generally, linear logic prompts a dynamic, i.e. interactive, view of the infinite, of the kind which is rendered by game metaphors. The scientific challenge is therefore to develop or to improve various tools of linear logic, so as to make these thinks really work, i.e. attack real complexity issues. We may think of *ludics* [5] (a revisiting of games, where types arise from interaction - an "existentialist" approach), or the introduction of "differential" structures inside logic. In particular, in ludics the logical ceases to be an externally superimposed transcendent norm, to become an emerging condition of procedural interaction: the logical rule is no more a respected norm, but a "geometrical" solution to the problem of dialogue between processes, an effect generated by the interaction.

1.2.2 A new methodology

*The approach is **geometrical**, an approach introduced in logic by linear logic.*

The geometrical approach in logic started with Linear Logic where (for the first time) a "geometrical" concept of proof (*proof nets*) has been introduced: proof nets are directed acyclic graphs, whose nodes correspond to logical rules. In this framework, the logical correctness of proof turns out to correspond to specific, global geometrical properties of a graph (namely, connection and acyclicity), and the process of interaction between proofs (that is, cut elimination) becomes simply a local operation of graph rewriting. Due to the Curry-Howard isomorphism between proofs and programs, the notion of proof net provides also a tool for studying logical characterization of distributed computing. Since the birth of Linear Logic, the geometrical study of logical proofs has been more and more developed, and has been refined using tools coming from important areas of mathematics (like analysis, operators algebras, homology, and so on).

1.2.3 New tools

Techniques based on interactional and geometrical approach may still not be enough, for the reason that these techniques analyse the infinite by means of the infinite, thus reaching a sort of cognitive blind spot*. Here comes a major methodological hypothesis, namely that* cognition *itself should become part of the interpretation, which means to understand the act of* constitution of the subject*. A fundamental clue in this direction is Connes' Non-Commutative Geometry [1]. The logical research program based on this methodological hypothesis is the program of "Geometry of Interaction" (GoI) [6] which can be seen as a sort of non commutative combinatorics of words. This methodological hypothesis contributes to the philosophical dimension of the event.*

- *Non-commutative geometry.* Non commutative geometry can be described as a sort of theory of non-sets, inspired by quantum physics. At a general level, this relies on classical results that a *commutative* operator algebra is a space of functions (continuous, measurable, …); thence a non commutative operator algebra describes the function over a "non-set".
- *Geometry of interaction (GoI).* Logical artefacts such as proofs (and their computational analogues, programs) become operators. Interaction is represented under the form of a *feedback* involving the solving of a specific linear equation. This theory is still experimental and in need of technical developments, in particular GoI should develop adequate tools to handle complexity issues. For instance, the building of GoI-inspired categories, or a second look at light logics (LLL style systems), not to speak of the tantalising idea of revisiting foundations from the viewpoint of GoI, i.e. a light version of linear logic.
- *Philosophy.* Since recent developments of linear logic (ludics and Geometry of Interaction) lead to the discovery that the relation subject / object determines the vision of the *perennial* (i.e. of the infinite and, finally, of algorithmic complexity), philosophical investigation is intrinsically involved in the scientific investigation, This prompts to avoid the pitfalls of *formalism* by questioning the traditional exclusive use of combinatorics of words in matters of foundations.

The new paradigm replace set-theoretical analysis of the infinite by a geometrical analysis of the complexity *of interaction, in the field of Geometry of Interaction. So, the* ***complexity*** *becomes a central theme of the research field.*

The Cantor-Dedekind approach to infinity (cardinals) appears clearly inadequate for analysing the infinite at the computational level. On the other hand, approaches trying to

tackle computational infinity as an asymptote of an increasing finite fail by lack of generalisability.

Instead of the usual explicit approach (a Turing machine with a clock), *light logics* (light linear logic, elementary linear logic etc) discovered in the 1990s prompt the idea of an *implicit computational complexity*, i.e. a level of complexity inherent to a given logical system. In those approaches, the weakened complexity of the computation process associated with proofs is an indirect attribute of logical rules, far from being an externally imposed artificial feature. The discovery of Light logics constituted the first existing *logical* explanation of non trivial intermediate levels of complexity. Because they opened up logically founded, potentially competing alternatives, they were also the first technical clue for a theoretical disqualification of the seemingly too huge level of "imperfection" (infinity) attached to classical computations. More recently, Ludics, where the respective role of interactions and logic are put the other way around (instead of controlling a posteriori the computation, logical rules emerge as solutions to the interaction problem) confirmed this analysis. Complexity thus becomes the cornerstone of the new foundational paradigm. Today, moreover, the transfer (performed by the "implicit computational complexity" methodology) of the infinite at the logical level and its reconstruction into the interactional framework makes it suitable to a geometrical study, i.e. analysable in terms of Geometry of Interaction.

The new paradigm, which describes geometrically the individual behaviours through their interactions (and not the other way around), is not only philosophically crucial, but also likely the source of future important technological issues.

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2 Main topics under focus during the school (short presentation)[1]

2.1 Linear Logic

In a restricted sense, Linear Logic is a substructural approach to logic proposed by the french Logician Jean-Yves Girard as a refinement of classical logic and intuitionistic logic, joining the dualities of the former with many of the constructive properties of the latter. It lends itself to many different presentations, explanations and intuitions.

- Proof-theoretically, it derives from an analysis of classical sequent calculus in which uses of structural rule of contraction and weakening are carefully controlled, but gave birth to a new, geometrical, representation of proofs : proof-nets.
- Operationally, this means that logical deduction is no longer merely about an ever-expanding collection of persistent "truths", but also a way of manipulating *resources* that can not always be duplicated or thrown away at will.
- In terms of denotational models, linear logic may be seen as refining the interpretation of intuitionistic logic by replacing cartesian closed categories by symmetric monoidal categories, or the interpretation of classical logic by replacing boolean algebras by C* algebras.

Taken as a more generic term, Linear Logic designates a branch of Proof Theory which provides various refined tools for the study of the computational aspects of proofs based upon ideas coming from Girard's works, which have been influential particularly because of its emphasis on resource-boundedness, duality, and interaction.

2.2 Ludics

Ludics comes from a proof-theoretical analysis of the principles governing inference rules of mathematical logic decomposed by linear logic, but is a pure (untyped) formalism. Key features of ludics are its notion of compound connectives using a technique known as *focusing* or *focalisation* (invented by the computer scientist Jean-Marc Andreoli), and its use of *locations* or *loci* over a base instead of propositions.

Ludics tries to retrieve known logical connectives and proof behaviours, by following the paradigm of interactive computation, similarly to what is done in game semantics of proofs to which it is closely related. By abstracting the notion of formulae and focusing of their concrete uses, that is distinct occurrences, it allows to provide an abstract syntax for computing, as loci can be seen as pointers on memory.

The primary technical achievement motivation of ludics is the discovery of a relationship between two natural, but distinct, notions of type or proposition.

- The first view, which might be termed the proof-theoretic or Gentzen-style interpretation of propositions, says that the meaning of a proposition arises from its introduction and elimination rules. Focalization refines this viewpoint, by distinguishing between positive propositions, whose meaning arises from their introduction rules, and negative propositions, whose meaning arises from their

[1] Some passages of this section have been inspired by articles from encyclopedias online.

elimination rules. In focused calculi, it is possible to define positive connectives by giving only their introduction rules, with the shape of the elimination rules being forced by this choice. (Symmetrically, negative connectives can be defined in focused calculi by giving only the elimination rules, with the introduction rules forced by this choice.)

- The second view, which might be termed the computational or Brouwer-Heyting-Kolmogorov interpretation of propositions, takes the view that we fix a computational system up front, and then give a realizability interpretation of propositions to give them constructive content. For example, a realizer for the proposition "A implies B" is a computable function which takes a realizer for A, and uses it to compute a realizer for B. Observe that realizability models characterize realizers for propositions in terms of their visible behavior, and not in terms of their internal structure. Girard has shown that for second-order affine linear logic, given a computational system with non-termination and error stops as effects, realizability and focalization give the same meaning to types.

2.3 Geometry of interaction

The Geometry of Interaction (GoI) was introduced by Jean-Yves Girard shortly after his first works on Linear Logic proof-nets. To distinguish the real proof-nets from all the possible networks, Girard devised a criterium involving trips in the network. Trips can in fact be seen as some kind of operator acting on the proof. Drawing from this observation, Girard described directly this operator from the proof and has given a formula, the so-called *Execution formula*, encoding the process of cut-elimination at the level of operators (in the sense of operators algebras).

3 The school's training goals and methodology

3.1 Audience at aim and training goals

For the thematic school "Proof Theory: Linear Logic, Ludics & Geometry of Interaction" and the "Conference on Transcendental syntax", the intended audience includes graduate students (master, PhD), post-doctoral fellows and academics interested with:

- Mathematical logic (in particular Proof theory)
- Logical foundations of Computing theory
- Philosophy of logic (in particular foundational aspects)
- Application of logic to linguistics (in particular Ludics)

The school is conceived as a self-contained training period in the main subfields of mainstream contemporary Proof-theory, inspired by works in Logical foundations of Computing theory. It aims at giving a full panorama of the state of the art in Linear Logic, Ludics and Geometry of interaction and their grounds along the last three decades.

3.2 Methodology

- The two first lectures will be introductory - with an attention payed to historical aspects. They will stress the main changes having affected the *questionning* in Logic and will recall the ideas preparing the "geometrical turn" in logic (Logical Constructivism and the Curry-Howard correspondance). All the other lectures, will progressively present all the part of the domain.

The order of the various lectures follows either the “genealogical” order or the “pedagogical order”.

- Each lecture will last one hour and half, and will be followed by 30 minutes for questions (and a brief pause). They will be only four lectures each day, the goal being to not charge too much the students and leave place to personal work and satellite discussions.
- Each lecturer will put in advance on line, the slides of his lectures. Printed handhouts will be also available.

4 Presentation of lecturers and speakers

4.1 Lecturers at the school

Marc BAGNOL — Lecturer at university of Mediterranean (Marseille 2). Laboratory: Logic of programming (IML, University of Marseille 2 and CNRS). Main research areas: proof theory, linear logic, proofnets, geometry of interaction, quantum information, category theory, ludics, game semantics
http://marc-bagnol.wikispaces.com/Marc+Bagnol

Emmanuel BEFFARA — Associated professor at University of Mediterranean (Marseille 2). Laboratory: Logic of programming (IML, University of Marseille 2 and CNRS). Main research areas : logical foundations of interactive and non-deterministic systems, linear-algebraic semantics of computation, proof/program correspondence outside functional computation.
http://iml.univ-mrs.fr/~beffara/

Valeria DE PAIVA — Mathematician and computer scientist, working in California, USA. Formerly a research scientist at the Intelligent Systems Laboratory of Palo Alto Research Center, California, and a search analyst for Cuill, Inc. in Menlo Park, CA. PhD in Mathematics from Cambridge University for work on "Dialectica Categories". She is Honorary Research Fellow at the School of computer science, University of Birmingham. Main research areas : logical approaches to computation, especially using Category Theory.
valeriadepaiva@org

Christophe FOUQUERÉ — Professor at the Computer sciences department of University Paris 13 (Paris Nord). Head of the Computer Sciences Laboratory of Paris Nord (LIPN)/ Member of the team: Logic, Computation, Resonning. Main research areas: Linear Logic. Computing theory and applications to linguistics. Ludics. Linear Logic.
www.lipn.fr/~fouquere/

Olivier LAURENT — Researcher at CNRS. Laboratory of Informatics for Parallelism (ENS-Lyon and CNRS). Main research areas: proof theory, linear logic, polarized nets, differential nets, computational isomorphism, implicit computational complexity.
http://perso.ens-lyon.fr/olivier.laurent/

Paul-André MELLIÈS — Researcher at CNRS. Laboratory Proofs-Programs-Systems, at the Department of mathematical sciences and Department of computer science. Main research areas: proof theory, game semantics, theory and practice of programming languages, formalized mathematics, proof assistants, mathematical physics, knot theory, quantum groups, n-dimensional algebra, operads
www.pps.univ-paris-diderot.fr/~mellies/

Alexandre MIQUEL — Researcher at CNRS. Laboratory of Informatics for Parallelism (ENS-Lyon and CNRS). Main research areas: proof theory, normalization, types

systems, denotational semantics of proofs/programs, coherent semantics, subtyping, intuitionistic and classical realizability in set theory.
http://perso.ens-lyon.fr/alexandre.miquel/

Elaine PIMENTEL — Associated professor at Federal University of Minais Gerais and Univalle (Columbia). Department: mathematics. Main research areas: proof theory, linear logic, intersection types, lambda-calculus.
http://sites.google.com/site/elainepimentel/

Myriam QUATRINI — Associated professor at University of Mediterranean (Marseille 2). Laboratory : Logic of programming (IML, University of Marseille 2 and CNRS). Main research areas: proof theory, linear logic, denotational semantics, ludics and linguistic applications.
http://iml.univ-mrs.fr/~quatrini

Thomas SEILLER — Lecturer at University of Mediterranean (Marseille 2). Laboratory : Logic of programming (University of Marseille 2 and CNRS). Main research areas: proof theory, linear logic, ludics, geometry of interaction
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Lionel VAUX — Associated professor at University of Mediterranean (Marseille 2). Laboratory : Logic of programming (IML, University of Marseille 2 and CNRS). Main research areas: proof theory, linear logic, ludics, denotational semantics, classical logic.
http://iml.univ-mrs.fr/~vaux

4.2 Speakers at the Conference in Philosophy of Logic

Michele ABRUSCI — Professor at the Philosophy department of Roma 3 University. Ex-Dean of the Faculty of Humanities. Head of Logic and Geometry of Cognition Group in Rome. Main research areas: proof theory, linear logic, history and philosophy of logic.
http://host.uniroma3.it/dipartimenti/filosofia/personale/schdado2.htm

Jean-Yves GIRARD : — Senior Researcher at CNRS. Laboratory : Logic of programming (IML, University of Marseille 2 and CNRS). Main research areas : Mathematical Logic, Computing theory, Proof theory, Linear Logic, Implicit Complexity, Ludics, Geometry of Interaction, Transcendental syntax.
http://iml.univ-mrs.fr/~girard/

Jean-Baptiste JOINET: — Associated professor at the philosophy department of university Paris 1 (Panthéon-Sorbonne). Laboratory: Cirphles (International Research Center Philosophy, Humanities, Sciences; ENS-Paris and CNRS). Resp. at Cirphless of Axis *Epistemology of new interfaces*. Coordinator of LIGC (Logic and Interaction research group). Main research areas : Proof theory, Linear Logic, Proofs-programs correspondance, Philosophy of Logic, Foundational studies in Logic, Theory of Negation, Theory of Definition.
http://www-philo.univ-paris1.fr/Joinet/index.html

Alain LECOMTE — Professor at University Paris 8 (Vincennes, Saint-Denis). Laboratory: Formal Structures of Language (CNRS and University Paris 8). Head of LOCI

	(program in ludics and linguistics, french National Research Agency). Main research area: linguistics, applications of Linear Logic to linguistics, formal semantics, ludics and modelization of dialogues. *http://lecomte.al.free.fr/*
Pierre LIVET	Professor in philosophy at University of Provence. Main research areas : philosophy of logic, epistemology of economics and sociology ; ontology of socil facts and beings ; Evaluation processes. *http://sites.univ-provence.fr/newceperc/spip.php?article28/*
Luiz Carlos PEREIRA	Professor at the philosophy department of Catholic Pontifical University of Rio de Janeiro (PUC-Rio) and Associate professor at State University of Rio de Janeiro. Team : Instituto de Lógica e Filosofia da Linguagem. Main research areas : logic, proof theory, natural deduction, proofs normalization, history and philosophy of logic, philosophy of language, History of Logic (Wittgenstein studies). *http://www.fil.puc-rio.br/depto_docente.html*
Paolo PISTONE	Lecturer at the Philosophy department of University Roma 3. Team: Logic and Geometry of Cognition Group in Rome. Main research areas: proof theory, linear logic, proof-nets, geometry of interaction, philosophy of logic.

5 Program of lecture and talks

THEMATIC SCHOOL : PROOF THEORY, LL, LUDICS & GEOM. OF INTERACTION			
	Monday 27 august		
1	9h-10h30	*From Curry-Howard correspondance to the geometrical turn in logic*	**Joinet**
2	11h-12h30	*From System F to the "coherent semantics" of Lambda-Calculus*	**Miquel**
3	14h30-16h	*From linearity in coherent spaces to Linear Logic (sequent calculus)*	**Vaux**
4	16h30-18h	*Linear Logic : sequent calculus, polarities, focalization, phase semantics*	**Beffara**
	Tuesday 28 august		
5	9h-10h30	*Linear Logic with subexponentials*	**Pimentel**
6	11h-12h30	*Game semantics*	**De Paiva**
7	14h30-16h	*Ludics*	**Fouqueré**
8	16h30-18h	*Classical logic: LC, correlations spaces*	**Quatrini**
	Wednesday 29 august		
9	9h-10h30	*MLL Proof nets. Sequentialization. Normalization.*	**Melliès**
10	11h-12h30	*MELL Proof nets. Polarized nets.*	**Laurent**
11	14h30-16h	*Light Logics*	**Laurent**
12	16h30-18h	*From Proof-nets to Geometry of Interaction*	**Seiller**
	Thursday 30 august		
Pause	8h30-15h	*Sea expedition around the bay*	*Pause*
13	16h-17h30	*Geom of interaction (1)*	**Girard**
14	18h-19h30	*Geom. of interaction (2)*	**Bagnol**
CONFERENCE IN PHILOSOPHY OF LOGIC AND COMPUTING « CONDITIONS OF POSSIBILITY FOR LANGUAGE »			
	Friday 31 August		
15	9h-10h30	*Transcendental syntax*	**Girard**
16	11h-12h30	*Transcendental syntax*	**Girard**
17	14h30-16h	*TBA*	**Abrusci**
19	16h-17h30	*TBA*	**Pistone**
	Saturday 1st September		
20	9h-10h30	*TBA*	**Pereira**
21	11h-12h30	*TBA*	**Livet**
22	14h30-16h	*TBA*	**Lecomte**
23	16h-17h30	*TBA*	**Giavitto**
	19h-21h	*Buffet*	

6 Organizational committee

- Luiz Carlos Pereira
- Jean-Baptiste Joinet
- Hermann Haeusler
- Bruno Lopez (webmaster : creation of the web site for informations, pre-registration, registration and payment on line)
- Alexandre Rademaker

7 Registration, registration fee and financial aspects

7.1 Registration fee

Depending of the amount of financial support obtained by the organizing comitee, simple participants will have to pay a registration fee (no fee for speakers, lecturers, organizers or people benefiting of a total exemption : see below « Financial help for participants »).

The amount of the registration fee will be fixed later and will be announced on line as soon as possible.

7.2 Financial help for participants

Depending of the amount of financial support obtained by the organizing comitee, funds will be available to help people with particular difficulties in coming to the School, though in a limited number of cases. This help is first and foremost intended to students and researchers without position. It shall consist of fee reduction (50%) or exemption (100%).

Demands will have to be sent before the end of june 2012, to the relevant email address (that will be indicated on the web site). They shall be accompanied by the following items :

1. a letter of application justifying the demand with regard to the candidate's situation and precising whick kind of help is requested
2. a letter of the PhD supervisor (for students)
3. a letter of recommandation (for researchers without position)

Notifications will be sent to candidates not later than the end of july 2012.

7.3 Pre-registration and registration on line (for the moment not available)

Once a web-site created (dedicated to on-line registrations), every participant lecturer, speaker, administrative organizer, simple participant will be asked to follow :

- **STEP 1 : Pre-registration for application**

  The application will be made on line (see timetables). The pre-registration aims at collecting as soon as possible the names and email addresses of people applying for the event (school and conference).

- **STEP 2 : Registration**.

  The registration will also be realized on line (see timetables). It involves :

- a confirmation
- the payment of the relevant « registration fee » (no one for speaker, lecturers, organizers or people benefiting of a total exemption : see below « Financial help for participants »)
- informations given by participants about the dates of :
  - their arrival to Rio (the 25th or the 26th august 2012) or to Paraty,
  - their departure from Paraty

7.4 Check-in at PUC-Rio

Taking account of the fact that an important number of participants (lecturers, speakers simple participants) will come from Europe with flights whose arrival to Rio de Janeiro could be too late to join Paraty on sunday 26th of august by one of the buses charterd by the organizing comitee), lecturers and speakers will be invited to arrive to Rio on Saturday. The reception and chek-in of lecturers, speakers and simple participants will take place on Saturday at the PUC-Rio campus, in the end of the afternoon (convenient practical conditions due to academic disponibilities will there be available).

Participants not in measure to reach Rio on Saturday, will be invited to go to the bus departure meeting on sunday, else to go to Paraty by regular buses.

Whenever the budget will allow, a buffet will be organized in the end of the afternoon (for lecturers and speaker and, if possible, all participants).

RECEPTION AND CHECK-IN AT PUC-RIO CAMPUS		
	Saturday 25	
	15h00-20h	**Reception of participants at PUC-Rio Campus (and late registration).** Presentation of PUC's Logic teams (comput. science & philosophy dept)
	19h-20h30	**Cocktail in PUC-Rio** (if possible)
DEPARTURE TO PARATY (by chartered buses)		
	Sunday 26	
	14h30h-18h30	**Travel from Rio to Paraty (Bus)**
	18h30-19h30	**Check-in (and complementary late registration)**
	19h30	**Dinner**

8 Timetable for participants

(Provisory informations : the dates indicated for registration may change)

15th of may to 15th of June	Registration and fee payment period (lower fees) : for the global event only : School & conference
15th of July to 15th of July	Registration and fee payment period (higher fees) : for the global event only : School & conference

25 August (saturday)	Reception of speakers and participants at PUC-Rio. Main registration.
26 August (sunday)	Conference Buses leaving from Rio (and, at Paraty, complementary registration and dinner).
27 August (monday) – 01 september (saturday)	School & Conference
02 september (sunday)	Conference Buses leaving Paraty to Rio early in the morning

9 Practical and social aspects

9.1 Venue

The School and the Conference will take place at the « Auditorum » of the Culture House of Paraty (Casa da Cultura), a multimedia space, abble to receive 170 people, and equiped with modern tools (video-projection…).

Paraty is a small and charming village declared Historical Heritage in 1958 because of its colonial houses that maintain the characteristics of the city's foundation in the 16th Century. Paraty is located in a bay with calm and crystal-clear.

The Culture House is located close to the bay, in a quiet and silent environment highly appropriate for concentration and work.

9.2 Social events

In the middle of the school, on the fourth day of work, a break is scheduled. A half day schooner boat tour around Paraty's bay will be proposed for all particpants.

The last day, a buffet will be organized in the evening.