Scientific report: "The Ways of Negation"
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Here is a summary of the research stay I conducted during two weeks in India (12-27 February 2014).

Insofar as my postdoctoral program is centered around a formal theory of meaning (Question-Answer Semantics: **QAS**), the concept of *negation* appears there as a cornerstone by giving rise to two meaning-forming procedures, namely: *opposition* between various meaningful objects within language as a set of *lexical fields* or web ontologies. To test and illustrate this formal philosophy of language, I proposed a series of talks in four different places in India. Each of the following works will be submitted in international scientific journals or books.

1. Kolkata: World Congress of Paraconsistency (WCP5), 12-17 February 2014
Title: "Eastern Proto-Logics"
Abstract: To make sense of the Jain *saptbhangi* (theory of sevenfold predication: SB) and the Madhyamaka *catuskoti* (Tetralemma or Four-Corned Negation: 4CN) requires a larger reflection about what logic means in these two predicative systems. On the one hand, SB and 4CN are not paraconsistent systems since the relation of consequence did not prevail in the two theories. On the other hand, most of the dominant Western interpretations (modal, many-valued) can be streamlined within **QAS**: it results in a logic of acceptance and rejection (AR_4), echoing Belnap's logic of First-Degree Entailment while imposing a restriction upon its semantics. SB is a one-valued system where any sentence is accepted in a multi-model (a set of different standpoints); 4CN is a *dual* one-valued variant of SB by rejecting the truth of any sentence. The general upshot is a plea for "proto-logic", i.e. a logic with a unique sentential operation of negation as permutation, without consequence relation, and whose purpose is not truth- but difference-preservation. In other words, a larger view of modern logic makes appear these ancient logical theories as non-Tarskian language-games.

2. Hyderabad: Center for Neural and Cognitive Sciences, 19-22 February 2014
Host: Pr Prajit BASU
Title: "On Negating"
Abstract: A series of philosophical problems have been presented about the concept of negation: Pamenide's Paradox, negative existentials, nothingness, incompatible colours. To disentangle these problems, **QAS** has been exposed and applied successively to make sense of these allegedly paradoxical situations. Not only are *not-being* and *nothingness* distinctive entities within the algebraic theory of valuation in **QAS** (where each object is given a *bitstring* as a unique logical value corresponding to a set of answers to prior ordered questions). But also, a more fine-grained theory of negation helps to avoid the current troubles created by a truth-functional reading of meaning in most of the modern logics.

3. Mumbai: Department of Linguistics, 23-25 February 2014
Host: Pr Avinash PANDEY
Title: "Linguistic Negations"
Abstract: Against a current bias to the effect that logical and linguistic negations are irreducible to each other, the algebraic machinery of **QAS** helps to depict "linguistic

negations" (neg-raising, litote, presuppositional existence, or implicature) as different sorts of opposite-forming operators within an abstract logic of opposition. Thus, the assumption relating negation, opposition and incompatibility is overcome by a larger view of negation as a difference-forming operator and gives rise to a common framework where e.g. litote proceeds as a superalternate-forming operator (by double mixed negation of contradiction and contrariety). These results thereby exemplify the published paper "Abstract Logic of Opposition" (*Logic and Logical Philosophy*, Vol. 21, 2012, pp. 415-438)

4. Chennai: Institute of Mathematical Sciences, 26-27 February 2014
Host: Pr Ramaswamy RAMANUJAM
Title: "A Logic for Tetris"
Abstract: The game Tetris is revisited through a threefold analysis. Firstly, the *formal semantics* of **QAS** has been depicted to surround the whole debate. Secondly, the *ontology* of Tetris is given as a maximal space W including seven figures with respective local spaces (viz. the maximal length of their possible transformations within W). Thirdly, the *logic* of Tetris is a set of two main questions: What are the figures used for? How to play the game? The result is an analogy between the two essential transformations of the figures in W (viz. rotation, and translation) and Piaget's operation of *reciprocity* in his INRC Klein's Group. Moreover, single 90°-rotation has been described as an operation of arithmetic progression upon ordinal numbers and *marked* bitstrings; by doing so, it goes beyond Piaget's Klein's Group and corresponds to a *semi-reciprocity* paralleling Lloyd Humberstone "demi-negation" § (such that §§p amounts to the classical sentential negation ~p). The game-theoretical question of winning (or losing) strategies in Tetris has been postponed for a later work.