ANNEX A

SCIENTIFIC DISCIPLINARY AREA MATHEMATICS AND INFORMATICS

RESEARCH PROGRAM NO. 1

The assessment criteria for the qualifications and the interview will be affixed on **1.7.2019** at **11.00** in Dipartimento di Matematica (DIMA), Via Dodecaneso 35, Genova.

The results of the qualification assessment as well as the names of the candidates admitted to the interview will be affixed on **2.7.2019** at **11.00** in Dipartimento di Matematica (DIMA), Via Dodecaneso 35, Genova.

The interview will be held on **4.7.2019** at **11.00** in Dipartimento di Matematica (DIMA), Via Dodecaneso 35, Genova.

Such a notice is equivalent to notification to all intents and purposes. All the candidates, who have not received notification of their exclusion, must sit for the exam, without prior notice, at the examination centre.

As regards candidates, who are not resident or domiciled in Italy, and those, who are resident or habitually domiciled at a distance of more than 300 Km from the selection centre, the interview, if requested, can also be held by electronic means (SKYPE video conference call) promptly contacting Prof. Giovanni Alberti on the phone number +39 010 353 6913 or via the email address: alberti@dima.unige.it

Scientific coordinator: Prof. Giovanni ALBERTI

NO. 1 research fellowship - Duration 1 year – Annual pre-tax amount: € 23.250,00

Title: Infinite-dimensional inverse problems with finite measurements

Description: Many imaging techniques, including electrical impedance tomography, elastography and ultrasonography, which are used in many contexts (medical imaging, nondestructive testing, geophysics, etc.), are modeled by inverse problems for PDE. Their analysis has now provided a deep understanding of their features. However, given the infinite-dimensionality of the problems, the recovery requires infinitely many measurements, which is never achievable in practice. The candidate will work on bridging this gap between theory and applications by combining methods of applied harmonic analysis, machine learning and PDE theory. We expect to obtain theoretical results with finite measurements under realistic assumptions on the unknowns (such as sparsity), and to derive related reconstruction algorithms.

Scientific disciplinary sector: MAT/05 ANALISI MATEMATICA

Place: Dipartimento di Matematica (DIMA)

Required degree:
Laurea magistrale delle classi LM-17 Fisica, LM-18 Informatica, LM-40 Matematica, LM-44 Modellistica matematico-fisica per l'ingegneria, LM-82 Scienze statistiche

Subjects of the interview:
PDE, inverse problems, compressed sensing, sparse regularisation theory, machine learning

The candidate will need to prove his/her knowledge of the English language.