Title of the internship

L1-L3 : Fine properties of functions
M1-M2 : Compactness methods

Name of the Laboratory with its address :
Institut de Mathématiques de Toulouse
Université Paul Sabatier
118, Route de Narbonne
31062 Toulouse, France

Supervisor name for the internship with his e-mail :
Mihai MARIS
mihai.maris@math.univ-toulouse.fr

Study level for the internship L1, L2, L3 or M1, M2
Any level from L1 to M2.
The subject will be adapted to the student’s knowledge and motivation.

Scientific area :
L1 – L3 : Mathematical Analysis
M1 – M2 : Mathematical Analysis & Partial Differential Equations

Duration of the internship (minimum 4 months maximum 6 months) :
Internship may start at any moment in April or May 2022.
Must end on September 30, 2022 (funds no longer available after this date).

Short abstract (4 lines maximum)

L1-L3 : The internship will focus on the study of some fine properties of functions and their
applications to important function spaces.

Master : The aim of the internship is to study special solutions (ground states) of partial differential
equations. The emphasis will be on acquiring some minimization and compactness methods and
the subsequent tools from functional analysis.

Key words

L1 – L3 : coverings, Lebesgue differentiation, Rademacher’s theorem, Lebesgue spaces, Sobolev
spaces.

M1 – M2 : Sobolev spaces, concentration-compactness, compensated compactness, regularity
theory, symmetry of solutions.