La prof.ssa Claudia Anedda, dell'Università di cagliari, sarà ospite presso Uniss il 15 maggio 2023, su invito della prof.ssa Francesca Gladiali, sui fondi FdS-2020.

Durante il suo soggiorno, il 15 maggio alle 15.30, la prof.ssa Anedda terrà, a Piandanna Aula A, un seminario dal titolo:

Titolo: OPTIMAL LOCATION OF RESOURCES IN A POPULATION DYNAMICS MODEL IN HETEROGENEOUS ENVIRONMENTS.

Abstract: We consider the indefinite weighted eigenvalue problem $-\Delta u = \lambda mu$ in a bounded smooth domain $\Omega \subset \mathbb{R}^N$, $N \ge 1$, under homogeneous Dirichlet boundary conditions, where $\lambda \in \mathbb{R}$ and $m(x) \in L^{\infty}(\Omega)$ and we study the minimization of the principal positive eigenvalue $\lambda_1(m)$ when m varies in an appropriate class of bounded functions. This problem is related to the study of reaction-diffusion equations in mathematical ecology, in particular to the dynamics of a population inhabiting a heterogeneous environment Ω , where m(x), called the local growth rate, is positive on favourable habitats (for the survival of the population) and negative on unfavourable ones. We consider the weight m(x) as sum of two (or more) terms $f_1(x) + f_2(x)$, where $f_1(x)$ and $f_2(x)$ can be interpreted as the spatial densities of two different types of

resources; under the constraint that the total size of each resource is fixed, but their spatial arrangement is allowed to change, we show that there exists an optimal choice of $f_1(x)$ and $f_2(x)$ for the population to survive, and we find the form of the optimizers. The proof relies on some results about existence and characterization of a minimizer of $\lambda_1(m)$ in the context of the classes of rearrangements of measurable functions and on a particular property about these classes. The talk is based on joint work with Fabrizio Cuccu.

1