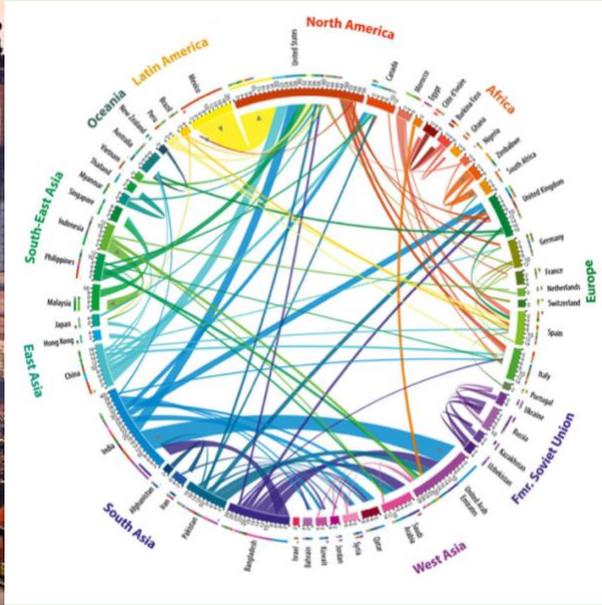


# Istituto Nazionale di Alta Matematica “F. Severi”



iNSAM



WG2 Ideas in Motion

“Models for people in motion in the Mediterranean basin”

Roma, April 23, 2021

Online Workshop

## PROGRAM (Central European Time - CET)

To connect to the workshop please contact: [graziano.gentili@unifi.it](mailto:graziano.gentili@unifi.it)

10:30 Opening remarks:  
Graziano GENTILI - Università di Firenze & IndAM, Giovanni TARANTINO - Chair of the PIMo COST Action

10:45 [Marco MAGGESI](#) - Dipartimento di Matematica e Informatica “U. Dini”, Università di Firenze, Italia  
*Studying the mobility of people and the spread of ideas through machine learning*

11:30 [Gabriele RUIU](#) - Dipartimento di Scienze Economiche e Aziendali, Università di Sassari, Italia  
*The good old ideas: an attempt to adapt the concept of chain migration to explore Italian students' mobility*

12:15 [Benedikt PERAK](#) - Cultural Studies Department, University of Rijeka, Croatia  
*Language networks in the research of the social reality*

13:00 [Anna GRILLINI](#) - Bruno Kessler Foundation, Istituto storico italo-germanico, Italia  
*Mapping mobilities. An historical and digital analysis of Trentino emigration between the 19th and 20th centuries.*

13:30 – 15:00 Break

15:00 [Vincenzo Giuseppe GENOVA](#) - Dipartimento di Scienze Economiche, Aziendali e Statistiche, Università di Palermo, Italia  
*A network analysis of students' mobility patterns from high school to master degree*

15:45 [Ginestra BIANCONI](#) - School of Mathematical Sciences, Queen Mary University of London, UK  
*The multilayer nature of networks: a new approach for network science*

16:30 [Gourab GHOSHAL](#) - Department of Physics and Astronomy, University of Rochester, NY, USA  
*A physics approach to study urban systems*

17:15 Closing remarks

## Organising Committee:

Graziano GENTILI - Università di Firenze & IndAM  
Anna GORI – Università di Milano  
Giambattista SALINARI – Università di Sassari  
Luisa SIMONUTTI – ISPF Consiglio Nazionale delle Ricerche, Milano

## Sponsors:

COST Action PIMo (CA18140) – People in Motion: Entangled Histories of Displacement across the Mediterranean (1492–1923)

Istituto Nazionale di Alta Matematica “F. Severi” - Roma

## Abstracts

**Ginestra BIANCONI** - School of Mathematical Sciences, Queen Mary University of London, UK  
*The multilayer nature of networks: a new approach for network science*

Many networks, including economic, social and transportation networks do not live in isolation but coexist and coevolve together. Complex systems formed by interacting networks have a multilayer network nature and are captured by a multilayer network topology. In this talk I will overview the advantages that a multilayer network approach offers with respect to the investigation of single networks.

**Vincenzo Giuseppe GENOVA** - Dipartimento di Scienze Economiche, Aziendali e Statistiche, Università di Palermo, Italia  
*A network analysis of students' mobility patterns from high school to master degree*

Human migration is about the movement of people from one place to another. In general, movements of human capital are characterized by multilateral flows that enrich socio-economic wealth. However, socio-economic problems may arise when flows become unbalanced—a prominent example being the unilateral mobility patterns of students from the South to the North of Italy. The identification and study of such mobility patterns have recently become of interest to scholars, intent on deepening the understanding of the reasons and the implications of human capital flows. This work aims to explore students' mobility from Sicily towards universities in other regions. In particular, our goal is to study the threestep migration path: area of origin (Sicilian provinces); region of bachelor studies; and region of master studies. The data used in this study include six cohorts of students, from the 2008/09 to the 2013/14 academic year. The dataset is represented as a multipartite network with four sets of nodes: students; Sicilian provinces; regions of bachelor studies; and regions of master studies. By projecting the student set onto the others, we obtain a tripartite network where the number of students represents the link weight. We reveal three-step preferential mobility patterns by generalizing the Statistically Validated Network approach [Tumminello et al. (2011), PLoS ONE, 6(3) e17994] to jointly test three-node motifs in multipartite networks. Results indicate the presence of a dichotomy between big and small Sicilian provinces. Specifically, mobility preferential patterns from the big Sicilian provinces—Palermo, Catania, and Messina—are few and stable over time, whereas patterns from small provinces are much more varied and less stable over time.

**Gourab GHOSHAL** - Department of Physics and Astronomy, University of Rochester, NY, USA

*A physics approach to study urban systems.*

Most things in the world are made up of systems of interacting parts, such that their global behavior is greater than the sum of their constituents. Such systems are often referred to as Complex Systems, with their defining features being the fact that they form Complex Networks and that their components interact in a non-linear fashion. Examples of Complex Systems are the human brain, financial markets, social media, infrastructural entities such as the internet, knowledge networks like the world wide web and indeed any socio-economic construct. A particularly important exemplar are cities, that encompass many of the systems listed above. In this talk I will provide a brief intro to the tools and techniques that physicists use to study complex systems and how its use in understanding urbanization has led to exciting new developments and insights.

**Anna GRILLINI** - Bruno Kessler Foundation, Istituto storico italo-germanico, Italia

*Mapping mobilities. An historical and digital analysis of Trentino emigration between the 19th and 20th centuries.*

The subject of the Migration History has a long tradition of studies in Trentino. The outgoing mobility of the population has on several occasions represented a haemorrhage of resources that can be compared to a veritable diaspora, both economic and emotional.

According to a recent definition of the historian Michele Colucci, the history of migration is to be understood as the study of people in time and space, and it is precisely from this dual perspective that the project is structured, starting from the available historiography and from the analysis of the thousands of passports that make up the sample identified. In addition to the "temporal" dimension, defined between 1870 and 1915 and characterised by the study of the historical context as well as the composition of the group of migrants, the "spatial" dimension is enhanced with the aid of computer and digital tools, the most suitable for synthesising large quantities of data but also for restoring with visual immediacy the characteristics of Trentino migration.

**Marco MAGGESI** - Dipartimento di Matematica e Informatica "U. Dini", Università di Firenze, Italia

*Studying the mobility of people and the spread of ideas through machine learning*

Neural networks and statistical learning techniques have proven helpful in a wide variety of situations, including social sciences and humanities. These methods are daily used to make sense of a chaotic world: time series forecasting, recognition of recurrent patterns, classification of unfamiliar objects, linguistic processing.

We propose an informal introduction to machine learning and its potential applications to study people's networks and mobility.

**Benedikt PERAK** - Cultural Studies Department, University of Rijeka, Croatia

*Language networks in the research of the social reality*

The talk deals with the application of Natural Language Processing (NLP) and graph technologies for analysis of the textual data using NLP tools and graph algorithms. It describes the process of integrating and enriching morpho-syntactically tagged corpora produced using NLP algorithms based on machine learning algorithms embedding with a knowledge graph information produced by NER techniques that can be used to explore corpus specific semantic relations for various type of empirical analysis of the communication, conceptualization and framing of the social identities, interactions, institutions and cultural models.

As a case study, the paper demonstrates the identification of co-occurrence of various types of NER data in English texts, as well as the use of the syntactic dependency networks for the stylometric and semantic analysis of the Croatian Parliamentary debates.

**Gabriele RUIU** - Dipartimento di Scienze Economiche e Aziendali, Università di Sassari, Italia

*The good old ideas: an attempt to adapt the concept of chain migration to explore Italian students' mobility*

Student mobility in Italy is a relevant phenomenon in terms of the number of people involved and its impact on origin and arrival territories. Indeed, for Italian universities, the ability to expand/defend the number of enrolled students is increasingly crucial, as the funding they will receive heavily depends on it. The literature produced on student mobility processes in Italy has shown that the movement is unilateral from the South to Central and Northern Italy. The phenomenon could further widen the economic gap existing between the areas of the country, affecting the survival capacity of universities located in the South. This research is part of the PRIN 2017 project "From high school to job placement: micro-data life course analysis of university student mobility and its impact on the Italian North-South divide". It aims to investigate which factors affect the choice of a university. Particular attention will be paid to the possible extension of the concept of migration chain to the analysis of mobility paths. This construct was introduced in the analysis of migration processes, and it refers to the set of interpersonal ties that connect current migrants, previous migrants and non-migrants in the areas of origin and destination through kinship, friendship and community of origin. This network has been shown to exert a considerable influence on the choice of destination for one's migration process as it favors the integration of the migrant in the place of arrival. In this paper, it is proposed that a mechanism similar to chain migration may explain the observed patterns of student mobility in Italy, especially those that involve medium-small size universities.