

MISS-ABMS

Multi-platform International Summer School on Agent-Based Modelling & Simulation

By taking part in this course, you will gain a modelling culture and learn the different skills required for building agent-based models (ABMs) applied to sociological, ecological, or socio-ecological systems

Key points of the training

In several ways, MISS-ABMS is **multi-cultural**

- Firstly, the trainers (around 8 to 10 by session) come with a diversity of backgrounds: we are geographers, ecologists, agronomists, computer scientists and modelers, and we propose to convey approaches and perspectives specific to each of the trainers' areas of competence and give a multicultural perspective in our training so that participants do not only learn from one point of view of agent-based modelling.
- Second, the participants come from diverse geographic origins (out of the 185 trainees who attended the training since 2011, 85 came from France, 23 from other European countries, 31 from Latin America, 26 from Africa, 7 from North America, 7 from South-East Asia and 6 from other countries), with very diverse backgrounds (agronomy: 37; ecology: 32; geography: 25; economy: 23; water sciences: 20; computer science: 13; social science: 12; ...), and different objectives (see below).

MISS-ABMS promotes a **collaborative practice of modelling and simulation**

- The trainers are agent-based modelers involved in pluri-disciplinary grounded projects and all of them believe that models are powerful objects for emulating collective work and thinking. During the training, you will carry out the practical work in collaboration with some other participants and you will learn tools and techniques to design and communicate your models.
- The personal objective of the participants may vary: while most of them aspire to improve their ability to implement an ABM by mastering one of the three platforms taught during the session, there are those who rather aim at gaining experience in how to link together the different stages of an agent-based modelling process. In any case, to fully benefit from the training session, participants should be engaged in a project including the use of an ABM: the training is specifically designed to help them to get a foot on the ladder.

What can you expect from attending MISS-ABMS?

MISS-ABMS is **multi-platform**

You will eventually work with only 1 platform but you will be introduced to 3 of the most prominent agent-based modeling platforms in the field of socio-ecological science:



You will have many opportunities to collaborate with participants using the other platforms. Before making your choice, light is shed on the advantages and disadvantages of each one.

The different stages of an agent-based modelling process are presented, with a focus on **model design and implementation**

- In the first days of this **2-week training course**, you will learn and practice conceptual modelling through an introduction to a graphical conceptual modeling language called UML (Unified Modeling Language), a protocol called ODD (Overview, Design concepts, Details), a co-design methodology called ARDI (Actors, Resources, Dynamics, Interactions).
- An introduction to the 3 platforms through a tutorial on how to implement from scratch a simple ABM is given to all participants. After selecting the platform on which they wish to improve their skills, participants follow a directed practical course which teaches them how to code a benchmark model. The remaining of the training is mainly dedicated to group work to go through the various stages of developing an ABM.

MISS-ABMS proposes a significant time for **Group Work** to design and implement an ABM based on proposed descriptions of situations well suited for agent-based modelling

- Participants will be invited to form groups of 2 to 4 people according to their interests. A set of typical situations and problems that can be studied with ABM will be proposed by the trainers. Choosing one of them, each group will design, implement and explore a model inspired from this situation. We encourage that in each group, framing and conceptual modeling is done collectively but that each participant implements the model on one platform. It means that ideally there will be in each group only 1 conceptual model, but as many implementations (possibly on different platforms) as participants.

What MISS-ABMS is not

- MISS-ABMS is not fully dedicated to the development of programming skills
- Models exploration, calibration and sensitivity analysis will be introduced but it is not the focus of the school. If these are your specific needs, you may be more interested in joining one of the advanced sessions (every 4 to 5 years) or specific training such as [ExModelo](#).
- Statistical analyses are not covered in our course. If you are wondering if an ABM could help you analyze your nice and huge field data but you do not know which tool to use, an introductory course to statistics may be of much more help than our training.
- As our training is on ABM design and implementation, if you are mainly interested by the process of participatory modelling, you'd be wiser to attend a Companion Modelling training.

Terms and conditions of participation

Skills and profiles of the candidates

- Each year we enjoy having participants with very heterogeneous profiles in terms of age, nationality, scientific background and experience in modelling or coding.
- Candidates should have an interest in applying modeling and simulation to sociological, ecological, or socio-ecological systems and sharing some or all part of the modeling and simulation process with people who are not modeling experts.
- Candidates who are not yet working on an ABM should have a clear idea about the one they will develop in the future. If this is not the case, please [contact us](#) before the course.
- No previous knowledge on ABM is required. However, as a large part of the practice will consist in programming a model on one of the platforms, some previous experience in computer coding is strongly recommended. For those without any consistent experience in computer coding, please [contact us](#) before the course.

Applications

- Participation in MISS-ABMS is subject to selection: applications will be studied by the organizing committee.
- To apply to the school, pre-registration is required. Please fill the online form [here](#).

Registration fees

- For classroom training (if sanitary conditions permit), the fees include training fees, lunches during training days, coffee breaks and one social dinner. Travel and accommodation are not included.
- Rates are set according to the statutes of participants:
 - o Researchers & postdocs: 1 500 €
 - o PhD fellows, students and permanent staff from CIRAD, INRAE, IRD and University of Toulouse: 800 €