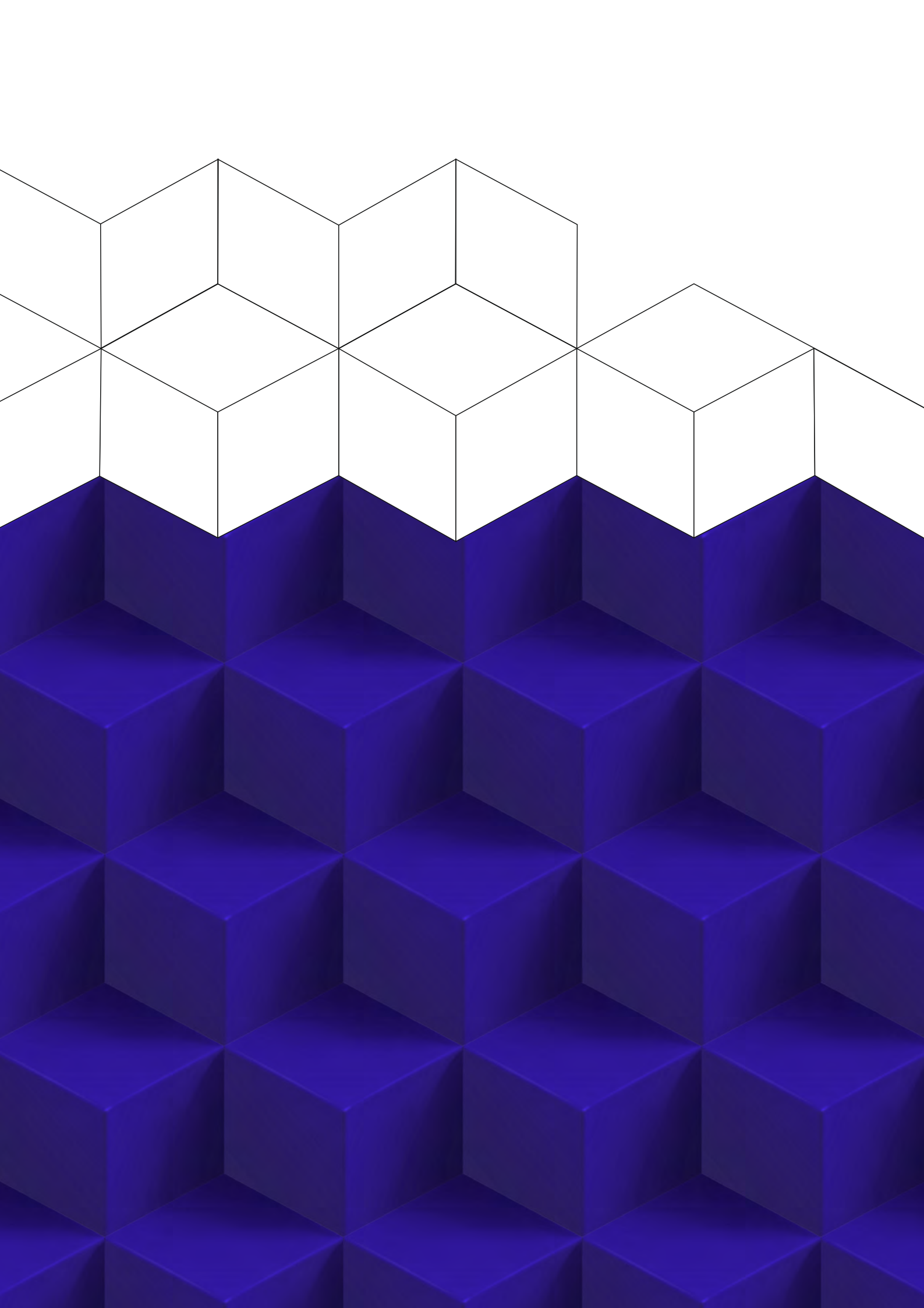


HANDBOOK

FOR RUNNING AN INTERNATIONAL
MODELLING WEEK

Mathematics for Industry Network (MI-NET)
<https://mi-network.org>
COST ACTION TD1409





ACKNOWLEDGMENTS

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APPENDICES

1 INTERNATIONAL MODELLING WEEKS

In recent years, numerous reports [1,2,3] and studies have demonstrated that **mathematics is an essential tool to improve industrial innovation**. Here, as in [2], we use the term “industry” to denote activities outside the realm of education and academic research, such as business and commerce (including financial services and healthcare), research and development laboratories, government and charities, plus commercial and not-for-profit research as well as development and production facilities.

An increasing need of mathematicians trained to work in an industrial environment has been observed and has pushed the academic world to provide novel training formats, able to respond to industrial needs.

The International Modelling Weeks (MW) format is an international workshop where early-career investigators (ECIs) receive hands-on training in **problem-solving, teamwork and in learning to exploit their different skills to model efficiently non-mathematical problems**. This handbook aims to guide users through the process of setting up, managing, and delivering an International Modelling Week in a systematic way, so that all parties can gain the most value from this activity.

HISTORICAL NOTE

International Modelling Weeks originated in Bari (Italy) in 1988, as an educational initiative of the European Consortium for Mathematics in Industry (ECMI) [4]. The format has proved particularly effective both in educating young industrial mathematicians and in creating links between students all over Europe. For this reason, ECMI continues to run such activities, mainly for students at master’s level [5]. The University of Limerick run a Student Mathematical Modelling Workshop, mainly for PhD Students, and MI-NET has sponsored several workshops across Europe via Training Schools. Similar types of workshop are now organized all over the world, including in particular, the US. The week provides an excellent precursor for participating in European Study Groups with Industry [6,7].

A STANDARD MODEL

Modelling Weeks are **training workshops where students from different countries spend a week working in small multinational groups on projects which are based on real-life problems**. Each group is led by an instructor who introduces the problem – usually formulated in non-mathematical terms – on the first day and then helps to guide the students to a solution during the week. The students present their results to the other groups on the last day and then write up their work as a report. The main aims of the Modelling Weeks are to train students in mathematical modelling and stimulate their collaboration and communication skills, in a multinational environment. The instructors “emulate” the figures of real industrial delegates as seen at European Study Groups with Industry. Being a training activity, it is recommended to evaluate the attending students and to provide some credits for this activity (typically 3 ECTS).

A typical Modelling Week format is outlined below.

During the first morning of the Modelling Week, instructors present the problems. It is important to note that the presented problems are usually not expressed in mathematical terms, to begin with. Typically, they are descriptions of a complicated industrial process, followed by a specific question such as *"How can we prevent this from happening?"*, or *"How can we accelerate or improve the production?"*, etc. In more recent years, instructors have presented more stochastic or data-driven problems, which are also very suitable for the Modelling Week format.

Instructors are typically experienced scientists, researchers with industrial or interdisciplinary collaborations, or industrialists involved in R&D activities, and should have at least a preliminary idea of the way the problem they are proposing can be solved. In particular, they should be aware of the mathematical instruments that can be used by the students to tackle the problem. A preliminary short list of references can be given to the students to help them to start addressing the problem.

Once all problems have been presented, the local organizers communicate to the students the composition of the groups, and each problem/group is assigned a room for the week. At this early stage, some voluntary student exchanges between the groups are still possible, at the discretion of the organizers.

During the afternoon of the first day, the groups meet with each instructor and ask more detailed questions. Ideally, at the end of the day, the groups should have defined, in broad terms, the approximate goals for the week.

During the rest of the week, the groups continue to work on the assigned problems. The instructors usually do not attend all sessions, they meet the students from time to time (at least twice per day) to discuss the ideas and partial results and give hints for further progress, if needed. The students should be left to autonomously explore the literature and develop their own code and software, possibly based on some predetermined programmes or routines provided by the instructor.

On the last day, all groups present their results to the other groups and any academics involved in their evaluation. Each presentation should last 15-20 minutes. Longer presentations are not encouraged, since the ability of the students of effectively summarizing their result is part of the evaluation process. It is preferable that every member of each group contributes to the final presentation.

A few months after the modelling week (typically 2 or 3 months, depending also on vacation periods), each group writes a technical report describing, in detail, the work carried out. The reports are reviewed by the instructors, and then given to the local organizers, who publish the reports on the web page of the event. In case of problems or data protected by some industrial non-disclosure agreement, only a short summary of the technical report may be published on the web page.

The students evaluation process is then performed by an academic committee which, after the completion of the reports, takes a decision, and provides the credits, based on the quality of the presentations and of the reports, consulting also the instructors for a more detailed opinion on the individual participation of the students to the group activities.

There are over 100 examples of problems and technical reports on the ECMI website [5] on an extremely wide spectrum of applications, ranging from biomedical problems, to materials science, logistics, finance, etc.

WHY RUN A MODELLING WEEK?

Modelling Weeks are a unique opportunity to train students in mathematics to work in an international industrial framework and to develop communication and collaboration abilities that cannot be obtained from classical lectures.

The immersive nature of the Modelling Week maximizes the impact for all participants. At the same time, it provides an excellent forum for students to develop and apply their problem-solving skills to real-world challenges. Finally, it is an unrivalled opportunity to build or reinforce relationships between mathematicians and industrialists, both from a joint research and student training point of view. Modelling Weeks also contribute to increase the visibility of mathematics to a wider audience, including not only industries, but also high-school teachers, colleagues from other disciplines, and the general public.

Red
RPM

- Fuel consumption
- Direction of Propeller
- Landing gear

$$F_0 = -\frac{1}{2} m c_1 |\dot{x}_m|$$

$$m \ddot{x}_1 = F_1$$

$$\hat{F}_1 = (x_1 - x) + F_1$$

$$m \ddot{x} = F_1 + F_2$$

$$\tan \theta_1 = \tan \theta_2$$

$$\sin \theta_2 = \sin(\theta_1 + \pi) = -\sin \theta_1$$

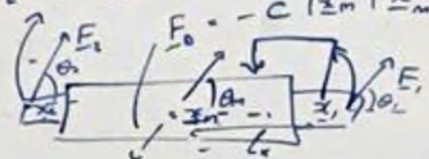
$$\frac{1}{12} L^2 m \ddot{\theta}_m = 2(x_1 - x) \sin \theta$$

$$\begin{aligned} \text{RPM} &\rightarrow F=T \\ P &\rightarrow F=T \end{aligned}$$

$$\Rightarrow h = \text{const.} = \text{RPM}$$

lever at h, z, P

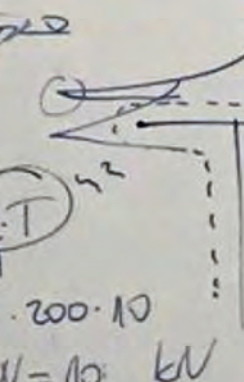
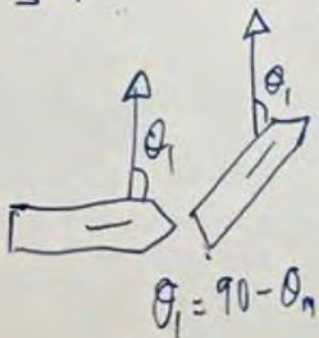
$$\begin{aligned} x_1 &= x_m + L x_1' \begin{pmatrix} \cos \theta_1 \\ \sin \theta_1 \end{pmatrix} \\ x_2 &= x_m - L x_2' \begin{pmatrix} \cos \theta_2 \\ \sin \theta_2 \end{pmatrix} \end{aligned}$$



$$(M + m_1(\theta_1)) \ddot{x}_m = F_1 \cos \theta_1 + F_2 \cos \theta_2 - c_1(\theta_1) \sqrt{\dot{x}_m^2 + \dot{y}_m^2} \dot{x}_m$$

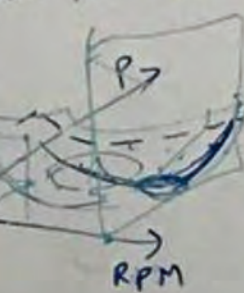
$$(m + m_2(\theta_2)) \ddot{y}_m = F_1 \sin \theta_1 + F_2 \sin \theta_2 - c_2(\theta_2) \sqrt{\dot{x}_m^2 + \dot{y}_m^2} \dot{y}_m$$

$$\frac{1}{12} L^2 m \ddot{\theta}_m = ((x_1 - x_m) F_1 \sin \theta_1 - (x_m - x_2) F_2 \sin \theta_2) - \frac{1}{3} \ddot{\theta}_m^2$$



$$200 \cdot 10$$

$$N = 10 \text{ kN}$$



$$\int_0^t$$

$$\dot{x} = F t$$

$$\begin{aligned} T &= F t \\ &= \frac{1}{2} T^2 F \end{aligned}$$

$$\frac{1}{2} T^2 F$$

$$\frac{1}{2} T^2 F$$

2

DETAILED DESCRIPTION OF ACTIVITIES

PLANNING

Based on experience of numerous Modelling Weeks organized in the past, the following schedule of activities is advised:

WHAT	WHEN
Fix a date	1 year before MW
Set up a local organising committee	10 months before MW
Financial management and fundraising	10 months before MW
Prepare a website	6 months before MW
Identify and select problems	6 months before MW
Announcements	ASAP and regularly
Student notification	3 months before MW
Define credits and recognition	3 months before MW

FIX A DATE

It is important to start planning the Modelling Week **at least 12 months in advance**. Deciding the date early on is important for two reasons: there are several events of this kind organised in Europe each year so it is important to secure the participation of students and instructors; the process of selecting problems with the correct target is time consuming, in particular when problems are posed directly by an industrial delegate, or are related to some up-to-date academic-industrial research.

When deciding on the date of the Modelling Week, to maximize the level of local participation take into account teaching schedules, research schedules, conferences and meetings in your country, holiday weeks, etc. Avoid clashes as much as possible.

Hostels and research infrastructures should provide sufficient space and resources (rooms, computer facilities, libraries, canteens, etc.) to host all the planned groups for a whole week.

SET UP A LOCAL ORGANISING COMMITTEE

The members of the organising committee should ideally be from various mathematical disciplines. In addition, administrative support and marketing expertise prove extremely useful.

For each of the following tasks, there should be a person within the committee responsible for:

- Overall coordination;
- Finances;
- Communication with academic community, including students;
- Communication with funding organisations;
- Logistics: catering, hotel/hostel reservation, registration, rooms, Wi-Fi;
- Marketing (including website, printed materials, social media, and press releases);
- Scientific proceedings (after the Modelling Week).

In general, **all members** should be involved in problem acquisition, actively contacting possible instructors to encourage them to provide a problem to be presented at the Modelling Week.

Recommended: Participate in an International Modelling Week as an instructor or by sending students and collecting feedback, in your country or in another European country, the year before hosting an event. To get in contact with other MW organisers from Europe, please contact members of the Management Committee of MI-NET (COST Action TD1409): <https://www.cost.eu/actions/TD1409/>.

3 FINANCIAL AND ORGANIZATIONAL MANAGEMENT

A Modelling Week can be funded both by some fundraising activity and by collecting participation fees.

Usually the local organizers are expected to cover the local costs of secretariat, marketing, advertisement, booking of the lecture/study rooms with equipment, the costs of lodgings of students, travel and subsistence of the instructors and their honorary (if any), local meals and coffee breaks for everybody, a social dinner at the end of the event and possibly an excursion during the week. The travels costs of students can be excluded from the budget and left to self-organization, depending on the availability of funds and by any specific spending rules of such funds.

Students can be hosted in university accommodation, possibly sharing double or multiple rooms to decrease the costs and favour socialising. Instructors are usually hosted in hotels, or in bed and breakfast structures with private single rooms and facilities.

FUNDRAISING

This should start as soon as possible, ideally more than 8 months before the event. This includes applying for grants from national and European scientific institutions (such as COST Actions [8] or ERASMUS), from local universities, from mathematics and statistics associations, from national tourism agencies, from local companies who collaborate in the proposed problems, or who are interested in recruiting students, and from any other sources who might be interested in sponsoring this event.

PARTICIPATION FEES

If the fundraising does not prove to be sufficient to cover all the related costs, a participation fee can be charged. In many cases such fees can be covered by the student's host institution. It is recommended to provide the students with a certificate of attendance at the end of the event, and a receipt of the amount of the paid fee, for reimbursement reasons.

This fee can vary, but the maximum amount depends on the country, and other sources of funding available. You should aim to at least break even [see Appendix 1- budget template]. Fees requested, in the first decade of 2000, for example by ECMI Modelling Weeks, range from 200€ to 350€.

Instructors should not pay for their participation, and often their costs can be covered by some public programme for international teacher exchange, like Erasmus or by COST Action Training Schools.

STUDENT SELECTION PROCESS AND SCHOLARSHIPS

Usually each modelling week may host a maximum number of students and groups/problems, depending on the cost and availability of lecture/working rooms, lodgings, etc.

The students should have the opportunity to express 2 or 3 preferences on the problem that they would like to work on, for example via a web questionnaire or by email. Each problem will be faced by one team of students, and the teams are composed by the local organizers, taking into account the preferences of the students, but also the fact that each group should be formed of no more than 10 students, and the origin of the students (both in terms of country, language and university) should be as balanced as possible. If the number of applications is expected to exceed the fixed maximum number of participants, a student selection procedure should be defined and advertised in advance. Selected students should be notified that they have been allocated a place at least 3 months in advance of the Modelling Week.

It is recommended to reserve a limited number of scholarships (up to about 10% of the total number of foreseen participants) to support the participation of students coming from disadvantaged countries, with limited access to funds for their travel and subsistence, or to students with particularly brilliant grades, or to sustain gender balance amongst the participants. The rules to select the beneficiaries should be clear and advertised on the website, and a specific committee should be appointed for the scholarship selection procedure. This typically comprises members of the organising committee, and sometime international experts. It is recommended that this coincides with the committee for student selection.

PREPARE A WEBSITE

A web page announcing the modelling week and containing all the relevant information should be prepared at least 6 months before the event. It should contain:

- A description of the modelling week and of its aims;
- Dates and location of the event, the timetable and reference contacts with the local organizers;
- Location and description of the accommodation for students and instructors;
- Participation fee (if any) and instructions for payment;
- The selection criteria for standard and scholarship (if applicable) places;
- A description of the proposed problems, including some indication on the mathematical prerequisites and on any programming skill or specific language required for the students to tackle them;
- A registration form (an online form usually is organizationally more convenient) where the students have to provide:
 - Their personal data;
 - Their academic data (position, university, academic age);
 - Any specific requirement for lodging or diet;
 - Up to 3 (ordered) preferences on the proposed problems;
 - Their academic interests or expertise (this information can be useful for the organizers to form the groups);
 - Travel times and dates, to book the rooms;
- Deadlines for registration and to apply for scholarships;
- (After the Modelling Week) the slides of the final presentations and the reports of the groups.

IDENTIFY AND SELECT INSTRUCTORS AND PROBLEMS

At the first meeting of the Local Organising Committee, compile a list of possible instructors, including:

- Colleagues (mathematicians) who have industrial collaborations, local or international;
- Colleagues from other disciplines who have both a strong quantitative experience and strong industrial links ;
- Personal contacts from industry, with special attention to people working in R&D, with a strong quantitative attitude, including alumni;
- Contacts in international networks of industrial and applied mathematicians, like for example ECMI (www.ecmiindmath.org).

When contacting possible instructors, please specify that the aim of the modelling week is not to provide classical lectures on up-to-date applied mathematical research, but to provide real non-mathematical problems which can be tackled with mathematical techniques.

PREPARING INSTRUCTORS IN ADVANCE OF THE MODELLING WEEK

- They must prepare a presentation on Monday (10-15 minutes, make sure it is on a laptop beforehand or test their laptop) **which describes their problem in a general and non-mathematical way.**
- They must be present for the whole week.
- They must ensure relevant material is available (data sets, background information, software and codes, etc.).
- They should attend the group presentations on the last day, and provide the Modelling Week organizers with their feedback on the way the group performed their task.

Where possible, choose instructors who will present problems so that taken together they will require a range of different mathematical disciplines, in order to exploit all the different competencies of the students. Before you decide to select a problem, you should take the following aspects into consideration:

- Is there a good mixture of data-driven and physics-based problems?
- Is the expertise to tackle the problem available at the students' level?
- Are the problems from different industrial areas, possibly including life sciences, or social sciences?
- The problems need to be formulated in such a way that at least a preliminary solution can be provided during the workshop but also not too easy so as to keep the participants working all week.
- If it is a data-driven problem, please take care that the data can be diffused to the participants.
- Is the problem suitable for marketing the Modelling Week outside academia? Potential target topics include social networks, police, public transport, health, food, etc.
- Has the instructor participated in a Modelling Week before? Instructors are welcome to participate in multiple workshops, and experienced instructors also require minimal introduction! Each time a new instructor participates, the reach of Modelling Weeks is broadened.

The number of problems should be chosen in order to ensure groups of around 6-10 students per problem.

If possible, offer to reserve the instructors a separate common room to work in when they don't need to be with the group.

If companies or colleagues are concerned about data confidentiality, one workaround is for a non-disclosure or confidentiality agreement to be set up between the local organising committee and the company to cover all pre-processing work. In this way, the organisers can view the original data, and help anonymise it so that no confidential details (for example names or addresses) are available to all participants.

ANNOUNCEMENTS

- Prepare and send out announcements to mathematical institutes, participants of previous years, and other local email lists (send reminders 2 months and 1 month before the deadline for students' registration).
- Announce on relevant mailing lists.
- Send an email to registered participants with info about the MW (acceptance, venue, program, website).
- Invite all sponsors.
- Invite contacts from funding bodies.
- Invite industrial representatives who are not funding or participating this year but who may be interested to be involved in similar workshops in the future.
- Invite a high-profile individual, such as the Rector or the Dean, or a president of some local industrial association, to open the event.
- Prepare the web site (**see Section 2**).
- Hire, or designate, a photographer to take photos at the event to put on the website and use in future promotion.
- Consider which social media channels you could use to promote the workshop.
- Invite high school teachers' representatives to attend the initial and the final presentations. This may increase the awareness of the need of industrial mathematicians in the younger generations.
- Invite press representatives to the initial and final presentations, in order to raise awareness of industrial mathematics with the general public.

PREPARE A POSTER WITH THE ANNOUNCEMENT OF THE MW

- Put an attractive, relevant, photo on it.
- Send it out 6 months before the event.
- Send it to as many mathematical departments at universities and research centers as possible.

MARKETING

- Make press announcements.
- Contact your university marketing office to help with writing and promoting the press release.

CREDITS AND RECOGNITION

It is recommended to make arrangements so that the students who actively participate in a Modelling Week are awarded with some ECTS (typically 3 ECTS for one week). The instructors must give some feedback to the organizers to confirm that all the members of their group actively participated in the problem solving and thus deserve the ECTS award. Typically, for such activity only a pass/fail evaluation of the students is provided, without a specific grade. Certificates of the awarded ECTS should be provided also to non-local students, who may obtain recognition from their host institutions, if applicable.

PRACTICAL TIPS

Organization

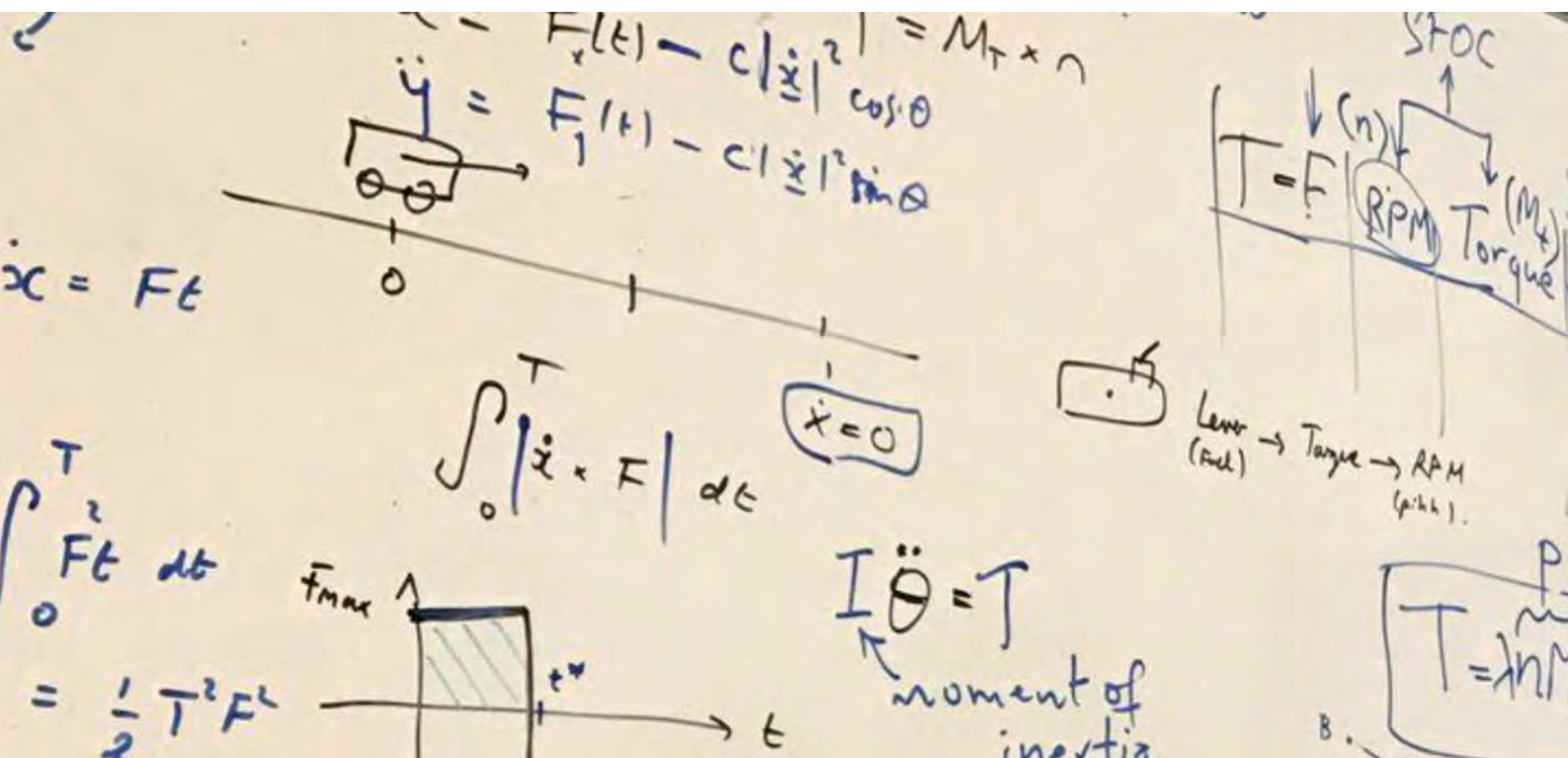
- Draft your own event checklist.
- In the six months preceding a Modelling Week, hold local organizing committee meetings on a fortnightly basis.

Accommodation

- Hotels or on-campus accommodation: make deals with hotels and/or use existing ones. Reserve rooms for participants that are not local.

Logistics

- Organize coffee/tea, soft drinks with snacks in a common area so that different groups can meet and interact informally.
- Reserve one larger room (up to 100 people) for Monday and Saturday and rooms for the different groups (which if possible can be locked so laptops can be left unattended). These rooms should be close to each other.
- Ensure there is access to WiFi and printing for non-local participants.





4 THE DRAFT PROGRAMME

A typical Modelling Week programme takes the following format (please note that this is the typical format for European countries where Sunday is not a working day, and Monday is the first working day of the week. In countries with a different structure of the working week the scheduling should be adapted accordingly):

▼ Sunday

Students arrival at the hostels/hotels

▼ Monday

- 9.30 - 10.00 Registration
- 10.00- 10.15 Welcome by high-profile official (for example Rector, Dean, Vice-chancellor for research, ...) and organizers
- 10.15- 11.30 Instructors present problems (10'-15' each)
- 11.30- 11.45 Coffee & tea
- 11.45- 12.50 Instructors present problems (10'-15')
- 12.50 – 13.00 Group formation
- 13.00- 14.00 Lunch
- 14.00- 17.00 Groups work with the instructors
- 19.00 Regular dinner

▼ Tuesday

- 9.00- 10.30 Group work
- 10.30- 10.45 Coffee/tea break
- 10.45- 12.30 Group work
- 12.30- 13.30 Lunch
- 13.30- 15.00 Group work
- 15.00- 15.15 Coffee/tea break
- 15.15- 18.00 Group work
- 19.00 Regular dinner

▼ Wednesday

- 9.00- 10.30 Group work
- 10.30- 10.45 Coffee/tea break
- 10.45- 12.30 Group work
- 12.30- 13.30 Lunch
- 13.30- 15.00 Group work
- 15.00- 15.15 Coffee/tea break
- 15.15- 18.00 Group work
- 19.00 Regular dinner

▼ Thursday

- 9:00- 10:30 Group work
- 10:30- 10:45 Coffee/tea break
- 10:45- 12:30 Group work
- 12:30- 13:30 Lunch
- 13:30- 15:00 Group work
- 15:00- 15:15 Coffee/tea break
- 15:15- 18:00 Group work
- 19:00 Regular dinner

▼ Friday

- 9:00- 10:30 Group work
- 10:30- 10:45 Coffee/tea break
- 10:45- 12:30 Preparation of final presentations
- 12:30- 13:30 Lunch
- 13:30- 15:00 Preparation of final presentations
- 15:00- 15:15 Coffee/tea break
- 15:15- 18:00 Preparation of final presentations
- 19:00 Regular dinner

▼ Saturday

- 9:00- 9:30 Coffee & tea
- 9:30- 11:00 Final Presentations (15'+ 5' each)
- 11:00- 11:30 Coffee & tea
- 11:30- 13:00 Final Presentations (15'+ 5' each)
- 13:00 Closing & lunch
- 14:00-19:00 Excursion for socialization and sightseeing
- 20:00 Social dinner

▼ Sunday

Participants' departure

The plenary sessions on Monday morning and on Saturday are held in a large lecture room. For the remaining time, smaller discussion rooms close to each other are needed (one for each group). Provide a key to the group leaders so that they can lock the rooms over lunch and at night.

TIPS

On Monday

- At the opening, introduce all members of the Organizing Committee so that people know whom to contact with questions.
- Have a diligent chairperson on Monday to ensure good timekeeping. There should be plenty of time for questions.

During the week (before the final day)

- Ensure each group is progressing adequately.
- Send an email to all participants to notify them of the order and length of the Saturday presentations. These should run for no more than 20 minutes.
- Inform the instructors that they will be asked to provide a few words to the audience to address their opinion on the group work.
- Inform participants about the final reports (deadlines, templates, contacts for submission) and ask the instructors to obtain the name of 1 contact person "rapporteur" in each group who will coordinate the writing process of this report. Encourage all participants to work on this report during the week itself.

On the final day

- After every presentation, ask the instructors to provide some informal feedback to complement the presentation.
- Distribute and collect feedback forms to both students and instructors.
- Final words (thank participants, companies, and funding).
- Announcement about proceedings and circulate template in LaTeX.
- Give details of next or upcoming Modelling Weeks.
- Organize the final social dinner in order to favor socialization and integration among students, to encourage the establishment of long term professional and/or friendly relationships. A typical activity that is organized, for example, in the ECMI Modelling Weeks is to ask to group of students of the same nationality to organize some entertainment for the others, showing something typical of their country of origin (songs, jokes, games, ...).

2-3 months after the workshop

- Deadline for group technical reports.
- Assessment of reports by the instructors.
- Local organising committee upload the reports to the webpage.

GOOD LUCK!

Organising a Modelling Week is a hugely rewarding educational experience!

5

REFERENCES

- 1.OECD – Global Science Forum: Report on “Mathematics in Industry”, July 2008
<http://www.oecd.org/science/sci-tech/41019441.pdf>
- 2.European Science Foundation, Forward Look on Mathematics and Industry: Final Report, 2010
- 3.Educational Interfaces between Mathematics and Industry: Re-port on an ICMI-ICIAM-Study, Alain Damlamian, José Francisco Rodrigues, Rudolf Strässer (Eds.), New ICMI Study Series, Volume 16, 2013, pp 199-204.
- 4.European Consortium for Mathematics in Industry (ECMI) web-site: <https://ecmiindmath.org>
- 5.ECMI Modelling Weeks <https://ecmiindmath.org/education/modelling-weeks/>
- 6.MI-NET, Mathematics for Industry Network, <https://mi-network.org/>
- 7.Mathematics in Industry information service, <http://miis.maths.ox.ac.uk/how/>
- 8.COST, European Cooperation in Science and Technology, <https://www.cost.eu/>

APPENDIX 1

Budget Template

Title:
Date:
Location:

PLEASE READ NOTES BELOW BEFORE POPULATING THE SPREADSHEET

Income	Price	No. Expected	Total
Registration			
<i>forecast</i>			0
<i>actual</i>			0
Sponsorship/Grant Funding			
<i>forecast</i>			0
<i>actual</i>			0
Sub-Total			
<i>forecast</i>	0	0	0
<i>actual</i>	0	0	0

Expenses	Price	No. Expected	Total
Meals			
<i>forecast</i>			0
<i>actual</i>			0
Travel Instructors			
<i>forecast</i>			0
<i>actual</i>			0
Accommodation Instructors			
<i>forecast</i>			0
<i>actual</i>			0
Accommodation Students			
<i>forecast</i>			0
<i>actual</i>			0
Printing, stationery, banners			
<i>forecast</i>			0
<i>actual</i>			0
Admin Costs			
<i>forecast</i>			0
<i>actual</i>			0
Room Booking			
<i>forecast</i>			0
<i>actual</i>			0
Social dinner			
<i>forecast</i>			0
<i>actual</i>			0
Other			
<i>forecast</i>			0
<i>actual</i>			0
Sub-Total (Expenses)			
<i>forecast</i>	0	0	0
<i>actual</i>	0	0	0

GRAND TOTAL (Income - expenditure)			
<i>forecast</i>			0
<i>actual</i>			0

Note:

1. This spreadsheet will allow you to keep track of your budget as things develop. It will also be helpful to see how accurate forecasts were to influence future budget plans.
2. Grey cells with numbers have inbuilt formulas, please click on each cell to ensure that the formulas are fit for the information you are inputting on the other cells.
3. 'Price' is unit price
4. grand total cells are on a traffic light system coded as 'red' for when expenditure exceeds income, amber when budget is breaking even and green when making a profit.

[TITLE OF THE MODELLING WEEK]
[CITY] – [COUNTRY]
Dates from – to (weekday, date, month, year)

	Name	Signature Day 1 [date]	Signature Day 2 [date]	Signature Day 3 [date]	Signature Day 4 [date]	Signature Day 5 [date]	Signature Day 6 [date]
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

[TITLE OF THE MODELLING WEEK]
[CITY] – [COUNTRY]
Dates from – to (date, month, year)

FEEDBACK REPORT FORM FOR STUDENTS

Please complete this form the last day of the Modelling Week (MW) and give it to the course organiser.

1. Student details

Name:

Home higher education institution:

Subject area of your degree/major:

Email address (not compulsory):

2. Identification of MW and motivation

How satisfied were you with the duration of the MW:

scale 1-5: 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

How satisfied were you with the dates of the MW?

scale 1-5: 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

Which were the factors which motivated you to participate?

scale 1-5: 1=not at all, 5=very much

Academic	1 – 2 – 3 – 4 – 5
Cultural	1 – 2 – 3 – 4 – 5
Practice of foreign language	1 – 2 – 3 – 4 – 5
Friends living abroad	1 – 2 – 3 – 4 – 5
Career plans	1 – 2 – 3 – 4 – 5
European experience	1 – 2 – 3 – 4 – 5
Other (please specify):	

3. Information and support

Where did you hear about the MW?

Home institution	Yes / No
Host institution	Yes / No
Other students	Yes / No
Former participants	Yes / No
Internet	Yes / No
Other (please specify) :

Did you receive adequate support from your home institution and from the host institution before and during the MW?

scale 1-5 : 1=poor/negative, 5=excellent

Home institution	1 – 2 – 3 – 4 – 5
Host institution	1 – 2 – 3 – 4 – 5

4. Accommodation and infrastructure

Type of your accommodation in the host country:

University accommodation	Yes / No
Apartment or house together with other students	Yes / No
Private housing	Yes / No

Other (please specify) :

Were you satisfied with your accommodation?

scale 1-5: 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

5. Recognition

Will you gain recognition for your MW by your home institution?

Yes / No /I don't know yet

IF yes, How will it be recognised ?

ECTS- Diploma supplement- other (please specify):

Did you encounter any problems concerning recognition of your MW ?

scale 1-5: 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

Please specify:

6. Costs

Total approximate personal contribution to the cost of the MW (EUR) :

What kind of costs did you need to contribute to ?

Travel to host institution	Yes / No
Accommodation	Yes / No
Materials used during the MW	Yes / No
Social programmes	Yes / No
Other (please specify) :	

7. Your personal experience – evaluation of the MW

Judgement of academic/learning outcomes of the MW :

scale 1-5 : 1=poor/negative, 5=excellent

1 – 2 – 3 – 4 – 5

Judgement of personal outcomes of the MW :

scale 1-5 : 1=poor/negative, 5=excellent

1 – 2 – 3 – 4 – 5

Did you encounter any serious problems during the MW ?

scale 1-5: 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

If yes, please specify :

How satisfied were you with the academic activities and the pedagogical aspects of the MW in terms of the following aspects?

scale 1-5: 1=not at all, 5=very much

The number of hours of work	1 – 2 – 3 – 4 – 5
The equipment used	1 – 2 – 3 – 4 – 5
The capabilities and expertise of the professors	1 – 2 – 3 – 4 – 5
The overall quality of teaching	1 – 2 – 3 – 4 – 5
The expected learning outcomes	1 – 2 – 3 – 4 – 5
The activities besides the general course	1 – 2 – 3 – 4 – 5

Do you think participation in the MW will help you in your further studies/career ?

scale 1-5 : 1=not at all, 5=very much

1 – 2 – 3 – 4 – 5

Do you think participation in the MW will help you in finding a job?

scale 1-5 : 1=not at all, 5=very much

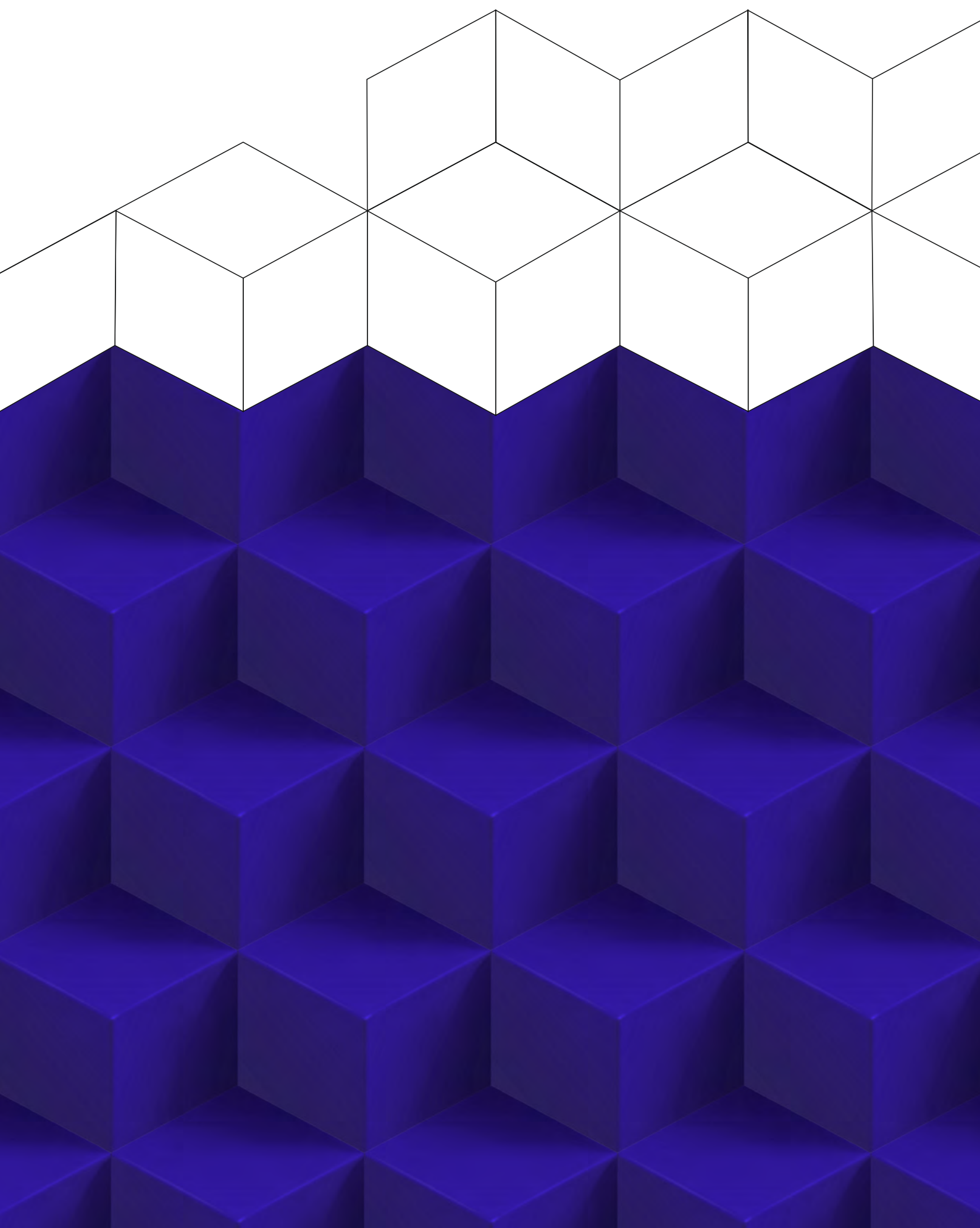
1 – 2 – 3 – 4 – 5

Overall evaluation of the MW :

scale 1-5 : 1=poor/negative, 5=excellent

1 – 2 – 3 – 4 – 5

Recommendations and ideas for the MW organisers:



Mathematics for Industry Network (MI-NET)
COST ACTION TD1409
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