Proposal for the organization of IAU Symposium

Predictive power of computational astrophysics as a discovery tool

8-13 June 2020, Le Majestic Congress - meetings Center, Chamonix-Mt.-Blanc, France

1 Proposer details[1]

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2 Proposed Symposium Details

Category	Symposia
General Assembly	no
Title	Predictive power of computational astrophysics as a discovery tool
Start date	8 June 2020
End date	13 June 2020
Location	Chamonix-Mt.-Blanc
Country	France

2.1 Organization

Organizing Commission: B1 Computational Astrophysics[2]

Coordinating Division: B Facilities, Technologies and Data Science (letter from the Div. B is in attachment)

Endorsing Divisions and Commissions:

We had a very intensive discussions with different Divisions and Commissions of the IAU and got a very useful comments. Most of them were incorporated into the proposal. The appropriate letters of supports are in attachment.

Division A Fundamental Astronomy
Division D High Energy Phenomena and Fundamental Physics
Division E Sun and Heliosphere
Division F Planetary Systems and Astrobiology
Division G Stars and Stellar Physics
Division H Interstellar Matter and Local Universe
Division J Galaxies and Cosmology

Commission D1, Commission E1, Commission G1, and Commission J1.

[1] In the text, *(M)* denotes *male*; similarly *(F)* stands for *female*.

[2] Link to the official website of Commission B1.

Scientific Organizing Committee chairs

Dmitry Bisikalo (Russia) (M)
Christian Boily (France) (M)
Tomoyuki Hanawa (Japan) (M)
James Stone (USA) (M)

Scientific Organizing Committee

Edouard Audit (France) (M)
Barbara Ercolano (Germany) (F)
Michiko Fujii (Japan) (F)
Erik Katsavounidis (USA) (M)
Irina Kitiashvili (USA) (F)
Michela Mapelli (Italy) (F)
Garrelt Mellema (Sweden) (M)
Shazrene Mohamed (South Africa) (M)
Elisabete M. de Gouveia Dal Pino (Brazil) (F)
Dongsu Ryu (South Korea) (M)
Alison Sills (Canada) (F)
Dmitri Wiebe (Russia) (M)
Feng Yuan (China) (M)
Simon Portegies Zwart (The Netherlands) (M)

Local Organizing Committee:

Edouard Audit (France), Chair (M)
Valerie Belle (F)
Patrick Hennebelle (M)
Pascal Tremblin (M)

Editors of proceedings:

Dmitry Bisikalo (Russia) (M)
Christian Boily (France) (M)
Tomoyuki Hanawa (Japan) (M)
James Stone (USA) (M)

Expected number of participants: 200-250 (max. capacity 360)
Registration fee in local currency and equivalent in euros: 300 € (Junior: 280 €).

Expenses covered by registration fee:

- **Venue:** yes
- **Transport to/from airport:** yes
- **Lunch:**[3] no
- **Coffee breaks etc.:** yes
- **Conference dinner:** no
- **Proceedings:** yes (ebook)

[3]On-site lunch will be offered at a negotiated special discount to participants when they register on-line.

Expected price of Hotels inc. breakfast: 120€ for single room (85€ dual occupancy) for 3-star Hotels (60€ single, 2-star Hotels)

Earlier symposia and conferences: The commission B1 on computational astrophysics was created just 3 years ago and we have not yet had the possibility to organize a specialized IAU symposium on this topic. While there have been a few IAU symposia in which computational astrophysics was an important component, the IAUS 270 *Computational star formation* (Barcelona, Spain) held in 2010 is the only recent one dedicated to computational fluid dynamics in an astrophysical context. Several others have included an aspect of computational astrophysics dedicated to their respective fields (for instance, IAUS 282 on stellar atmospheres [2010]; IAUS 298 on LAMOST and Gaia modeling [2013]; IAUS 309 on 3D Galaxies [2014]; and the forthcoming IAU Symposia 351 on Star Clusters: from the Milky Way to the Early Universe [May 2019] & 353 on Galactic Dynamics [July 2019]).

At the same time the self-organizing consortia of astrophysicists (like the European Science Foundation's ASTROSIM, MODEST Consortium, and ASTRONUM Consortium) have held conferences on this topic every year. Many members of the Commission B1 are members of these consortia too, and have actively participated in these conferences.

The majority of the meetings (ASTROSIM, MODEST, ASTRONUM) are aimed at rather specific topics or geographic regions (e.g., EANAM for East Asia). The few exceptions, such as the 2011 meeting in Cefalu on *Advances in Computational Astrophysics*, and 2008 in Ascona on *Frontiers in Computational Astrophysics: The Origin of Stars, Planets and Galaxies*, covered a plethora of computational astrophysics. These two meetings worked excellently in covering a wide range of topics but at the same time stayed sufficiently focused. We aim at a comparable combination of scope and depth. We also stress that young researchers should have the best opportunity to be well grounded in computational techniques applied in very different contexts, as modern science is ever more organized across multi-disciplinary lines. It is also clear that the landscape in astrophysics has changed dramatically since 2011 with the advent of large facilities for data acquisition and storage, blurring the boundaries between theory and data analysis & interpretation. The proposed Symposium would make a timely and unique contribution to this new landscape.

Requested support from IAU: 18 800€

Justification of requested funding and risks

Justification. The booking of the conference venue will amount to (roughly) 30€/day /participant for a total of 31 k€ for a week-long symposium, excluding the standard perks for such an event (coffee breaks, welcome session, etc.). The incompressible part of the budget amounts to 33 400€; see Table 1 below. All of these expenses should be covered by the registration fee which we fix at 300€ for senior scientists, and 280€ for junior scientists and PhD students. We will actively support the attendance & participation of young researchers; of researchers from developing countries; and of participants that have excessively high travel costs. An effective way to do this is to waive their registration fee, and/or subsidize their local expenses. We also intend to waive the registration fee for the 24 invited speakers of the science program: the registration fee will cover for this, as well as the expenses for the ebook of the proceedings (some 12€/ participant).

Based on 200 participants as a reference figure, we aim to waive the conference fee of **forty** young participants (40, i.e. 20%), and additionally sponsor the local costs (340 €/week for boarding at

a mid-range hotel) for a further 20 participants. Taken together the IAU grant requested amounts to 18 800 €. (Note here that the registration fee could be reduced by $\sim$ 30€ if 250 participants registered.)

Part of these funds will initially be used as a deposit to book the conference venue and guarantee the hotel block bookings. The amount will be returned in full once participants have booked and covered their hotel deposit (if it still applies). We expect this to take place some two months prior to the meeting. The funds recovered from venue booking and those from fully registered participants will allow us to sponsor additional young researchers, as indicated above, should registrations reach over the threshold value of 200. If that were the case, we would prioritize a partial refund of the registration fee to all PhD students or other similar measure in line with our stated objectives (scientific excellence, geographic representation, gender balance, support for young researchers).

Table 1: List of expenses covered in full by the registration fee. All figures provided by the Majestic Congress Centre in Chamonix-Mt.Blanc, inclusive of local taxes.

Item	costs*
Transportation	20€
Welcome reception	15€
Coffee breaks	53€
Conference Hall	155€
Science program	35€
Proceedings	12€
Total :	290 €

*The prices are understood per participant, based on a reference of 200 participants; the contribution from the registration fee for the conference Hall drops to 123 € for 250 participants.

Risks There is no formal risk to visitors to the Chamonix area known to the organizers (disease, natural hazards, political, ..). As for financial risk considerations, they are essentially non-existent because (as we understand the situation) the cancellation of the conference itself, and so the booking of the conference venue, would carry no penalty if done within the agreed contractual calendar.

In case the registration count fell short of 200, we would consider slashing the support for airport transportation and/or local expenses which, provided we were granted the maximum support from the IAU, should allow the conference to go ahead with as few as 150 participants.

Concerning hotel block bookings and negotiated prices: these can only be held for a fixed period of time. Thus late registrations will likely result in higher rates, and make participation less likely. We hope to block-book rooms in at least four two-star downtown hotels. Note that many participants will seek out their own accommodation (through services such as Airbnb) which should allow us to reduce the number of pre-booked rooms early on in the registration phase and choose among the very best offers only. The final booking is the sole responsibility of the participants.

3 Scientific Justification

4 Scientific Justification

Abstract

Computational astrophysics is fast becoming indispensable for data-handling and scientific discovery in astronomy. A spectacular example is the recent calculation of gravitational wave forms to high accuracy coupled with sophisticated algorithms for signal analysis, together enabling an undisputed detection. The main objective of this Symposium is to capitalize on such exciting advances. To that end, we will bring together top scientists in a broad variety of research fields to single out bold predictions that meet today's outstanding challenges from theory and observations. Computational approaches to data-mining and theoretical modeling of phenomena at various scales (from planetary- to extra-galactic scales) will be covered. Strategies for combining physical processes simultaneously at different energy levels will be sought, with an eye on current issues brought up by high-accuracy observations (Alma, Chandra, ..). Topical challenges from future space- and ground-based facilities (JWST, Euclid, SKA, ..) will receive special consideration.

Scientific rationale

A new paradigm for scientific discovery through computational tools is rapidly pervading every aspect of research in astronomy. This Symposium aims to galvanize on-going developments in computational astrophysics by bringing together astronomers in different fields to share their knowledge and approaches to computational astrophysics. By doing so, we hope to ensure the highest level of synergy between these various fields and that this will carry over to new research programs and bolster scientific collaborations, a stated objective of Commission B1. One of the motivations for a Symposium is to assist this new IAU commission find its footing in the global astronomical community, and reach out to young researchers especially.

Computational astrophysics combines modern computational methods, novel hardware designs, advanced algorithms, original software implementations and associated technologies to discover new phenomena, and to make predictions in astronomy. It is therefore important to trace out the contour of the meeting.

The Symposium will focus on computational methods applied to speed up and broaden the scope of scientific studies, such as finding trends from observational data, high performance computing, automated search algorithms, and model predictability. The meeting will bring together experts to discuss a palette of challenging informational and technical developments, including hardware and software but always focused on the astronomical applications. Special attention will be given to numerical integration schemes and emergent behavior (e.g., so-called Artificial Intelligence methods). These topics are rather novel for astronomy and have been growing dramatically since the introduction of digital computers in research.

We believe the time is ripe to hold such a meeting as the *big data* era is in full swing (Gaia DR2 already, LIGO/Virgo, ALMA, SKA, LSST, the forthcoming JWST, ..) and in view of the other Symposia and major conferences held recently on similar, complementary topics. The excellent facilities as the renowned Chamonix-Mt-Blanc conference center make it ideal for concerted discussions and fruitful exchanges. The conference center host regular gatherings of up to 400 participants, double the target figure for this Symposium. Its geographical location (major airports in Geneva, Switzerland, and Lyon, France) means that it is easily accessible yet set in surroundings of exceptional quality that should appeal to many. The end-of-semester slot (mid-June 2020) should

boost registration figures among students and academic staff.

Key Topics

The symposium should cover as broad a range of physical phenomena so as to be representative of the variety of processes at work in astrophysics, and to showcase a large array of computational strategies developed to tackle them. Within the constraints of a week-long symposium, the list of topics- and sub-topics covered includes:

- Strong gravity: accretion disks, jets, BH- & NS binaries, gravitational waves
  {pair creation & diffusion, SED and transport, post-Newtonian & GR solvers, wave-front and signal analysis, ..}
- Large-scale structure, galaxy formation and evolution
  {gravitational dynamics and HPC, radiation field and feedback, adaptive grids, hydro- and MHD, stellar population synthesis, .. }
- Star formation and the interstellar medium
  {the warm- to cold ISM, chemical networks and reactions rates, disk structure and gas flows, MHD and recombination, circumstellar discs: heating, structure, .. }
- Stellar evolution, including supernovae and common-envelope binaries
  {angular momentum transport, 3D modeling of convection, contact binaries and mass transfer, nuclear reactions for supermassive stars, computing SEDs .. }
- Solar and exo-planet systems
  {host stars and solar physics, star-exoplanet interaction, planetary atmospheres, planet formation, protoplanetary discs, resonances and migration, structure and stellar SEDs, secular evolution, perturbed Hamiltonian systems, .. }
- New computational tools and data mining
  {HPC and computer architecture, scripting and optimization, Bayesian inference and Big Data, non parametric fits of spectra, automated quality control/validation, inversion methods .. }

The broad range of topics should favor cross-matching of physics at various scales (e.g., accretion regime in star formation problems; accretion in strong gravitational fields; the global spectral energy distribution in galaxies, and so on) and their associated techniques. Simulation data and source code maintenance; distributed computing and special hardware; complexity, multi-scale and emergent behavior, numerical convergence issues should all be covered to various degree in each session. We plan to pay a special attention to the predictive power of the computational astrophysics, and want to discuss both the predictive models already being researched (like CME forecast predictions based on complex MHD modeling in solar physics) and elaborated models (like EM signal from BH merging) that should provide new discoveries in the different field in nearest future. One can appreciate, on reading the various sub-topics, how much a specific technique (of fluid heat transport, for instance) may apply to a different problem, in a different regime (say, circumstellar- and galactic disc formation, or even SMBH accretion discs); likewise Monte Carlo methods will find their utility to model the complex pair-creation process in the large-B atmosphere of neutron stars, as well as in the computation of opacity effects in the intergalactic medium.

We are particularly interested in discussing the numerical methods and algorithms used to solve the various physical phenomena on a computer, such as the differences between addressing hydrodynamics with a Lagrangian or and Eulerian method, but also how to solve systems with extensive spatial and temporal domains. We hope the array of topics covered will achieve this.

International opening and interdisciplinary character

Computational astrophysics has a particular global appeal due to the global digitization and competitive time-allocation on *de facto* international facilities. The discipline often requires high performance hardware, but not exclusively so. Excellent scientific progress can be achieved on small desktop computers, while algorithmic studies hardly require any computational time. Therefore computational astrophysics should thrive also in institutions less endowed with in-house computational resources, or in technologically emerging countries.

The interdisciplinary and international character of the topic is reflected in the membership of the organizing committee as well as in the proposed list of invited speakers (17+ countries from every continents). We note that the SOC/LOC has a near-balanced representation of genders: we expect that this will have a similar positive impact on the list of registered participants.

4.1 Thematic sessions

Plenary sessions. The pillars of the Symposium are topical plenary sessions. In this fashion each major topic will be given sufficient time for a review of the field and expanded discussions.

Short presentations / posters. Time will be allocated at the end of each day for a review and discussion of short- and poster presentations. These can run in parallel, in adjacent rooms, if and when their number justifies it.

Workshop / training. A free afternoon will be set aside to help foster discussions and exchanges between participants. Our intention is to encourage especially the PhD students to mix with established scientists, to share their experiences and know-how. We will explore the possibility to setup group meetings (main Hall and meeting rooms will be used for this) with conveners, paying special attention to promote gender balance.

Public outreach. In tandem with the local congress personnel and tourist authorities, an evening will be devoted to showcase the science covered at the Symposium, possibly involving local schools. To that end we will consider a special session in French for a more effective public outreach exercise. We do not exclude to hold open doors for the public prior to a more formal conference. We will seek strong involvement from female- and young scientists attending the meeting (making use of e.g. posters, but also modern outlets such as Youtube, Dailymotion, etc).

Outdoor excursion / Conference dinner. These optional activities will be integrated with a view to enrich the scientific context by taking advantage of the extraordinary local scenery and gastronomic delicatessen.

4.2 Expected outcome

With this symposium we strive at bringing together a number of astronomers and computer scientists, for intense exchanges on methodologies and best practices, and have stimulating interdisciplinary discussions. The results will be published in a proceedings, which should be a reference for future computational astrophysics research.

4.3 Timeliness

Commission B1 on Computational astrophysics was created in 2015 in part as a response to the expansion of scientific computing and ever more sophisticated algorithms for data analysis, at the dawn of the 'big data' era. Now in its second three-year mandate, the Commission membership of above 285 reflects a growing interest from a significant spectrum of the astronomical community. Since computational tools and hardware continue to improve in quality and ease of use, the expectation is that the number of computational astrophysicists will continue to grow over the next several years.

Astrophysics must make a niche for itself in the emerging field of multi-scale, multi-physics modeling, as in other fields of science. To achieve this, it is important to pull together resources to optimize progress. We hope that this Symposium will help foster new ideas and gather momentum by bringing together a majority of the specialists in computational astrophysics.

4.4 Symposium scientific themes

We have separated the symposium in 5 fundamental themes: Strong gravity: accretion disks, jets, BH- & NS binaries, gravitational waves; Large-scale structure, galaxy formation & evolution; Star formation and the interstellar medium; Stellar evolution (including supernova and common-envelope binaries); Solar and exoplanetary systems; and topics devoted to new computational tools & data mining. These topics do not cover all of computational astrophysics, but give the brightest examples of its discovery power. According to our estimates, the total number of IAU members working in these 6 fields exceeds 1000, so we hope to generate much interest in the Symposium from the astronomical community.

With each topic, we identify 4 key researchers in the major subtopics of the field, and most of them (21 from 24) is already agreed to be an invited speakers if the Proposal is approved:

- Strong gravity: accretion disks, jets, BH- & NS binaries, gravitational waves
  Rainer Weiss (USA,M), Feng Yuan (China,M), Stephan Rosswog (Sweden,M), Masaru Shibata (Germany,M).

- Large-scale structure, galaxy formation & evolution
  Mark Vogelsberger (USA,M), Volker Springel (Germany,M), Tom Abel (USA,M), Kathryn Johnston (USA,F TBC).

- Star formation and the interstellar medium
  Ralf Klessen (Germany,M), Volker Bromm (USA,M), Patrick Hennebelle (France,M), Catherine J. Clarke (UK,F TBC).

- Stellar evolution including supernova and common-envelope binaries
  Ana Ines Gomes de Castro (Spain,F), Thomas Janka (Germany,M), Corinne Charbonnel (Switzertland,F), Tomoya Takiwaki (Japan,M).

- Solar and exoplanetary systems
  Alexander Kosovichev (USA,M), Alessandro Morbidelli (France,M), Nick Pogorelov (USA,M), Alain Lecavelier des Etang (France,M).

- New computational tools and data mining
  Andrea Mignone (Italy,M) , N. Ivanova (CA,F TBC) Sergey Klimenko (USA,M), Anthony Brown (M,The Netherlands).

Our reserve list of invited speakers include P. Hopkins (UK, M), E. Ostriker (USA, F), M. Krumholz (Australia, M), S. Toonen (NL, F), A. Mezzacappa (USA, M), O. de Marco (USA, F), S. de Mink (NL, F), J. Makino (Japan, M), and M. Kuznetsova (USA, F). On the last day we plan to organize the Concluding remarks panel that will be lead by Yuri Aikawa (Japan, TBC, F) and S. Markoff (USA, TBC, F). We realize that the current list of SOC members and speakers include only 18 women scientists out of a total of 51 (or, 35.3%), a low figure compared to recent IAUS (e.g., 343 or 344) where near-exact parity was achieved. While a percentage of 35%remains unsatisfactory, we note that it is roughly twice as high as that of the current membership of commission B1. Many other excellent female scientists that would make a major impact on the Symposium will be contacted by the SOC and invited to be speakers and/or conveners; they will be the top choices as the current list of speakers continues to evolve.

We hope that the scientific program will encourage more women to join the commission and become active in computational astrophysics generally. To improve the situation, and looking for a lasting impact on the future of the field, the selection committee is aiming to *award a significant majority of the 40 IAU travel grants* to **female scientists**; a similar policy will apply to the award of local support. Furthermore, we will target systematically female participants in the selection of conveners and session chairs, drawn this time from the full list of participants (inc. young PDRAs especially). These policies will be underscored in the Commission B1 Newsletter and other advertisement outlets.

4.5 Program outline

Format

The symposium is proposed as a 5 day meeting. Each day will feature 4 plenary sessions organized around the symposium topics, except on Wednesday when two plenary sessions are scheduled. No parallel sessions will be scheduled, as the intent is to maximize exchanges between the various communities.

For each of 6 topics we have 3 plenary sessions with duration of 1h 40 min. During the 1st session of the topic we will have 2 invited talks (20 minutes each) and 4 contributed talks (15 min each). The 2nd session of the topic will keep the same structure. The 3rd session will have 4 contributed talks (15 min each) and 40 minutes for the poster presentation. In total, for each topic we will have 4 invited talks, 12 contributed talks, and 40 minutes for poster presentations (2min/poster, or 20 posters). For this scheme the total number of talks displayed in the conference should be 4+12+20 = 36 $\times$ 6 topics = 216.

Posters will be set up in the coffee area. We also plan to use electronic devices for more a more effective display. The meeting will close with an open discussion led by a panel of (minimum) six experts; the LOC/SOC will strive to enhance the contribution from expert female scientists during that session.

The topics can be subdivided as in the following list of scientific sessions:

Sessions 1, 2 & 3	Strong gravity: accretion disks, jets, BH- & NS binaries, gravitational waves
Sessions 4, 5 & 6	Larg- scale structure, galaxy formation & evolution
Sessions 7, 8 & 9	Star formation and the interstellar medium
Sessions 10, 11 & 12	Stellar evolution including supernova & common-envelope binaries

Sessions 13, 14 & 15	Solar and exoplanetary systems
Sessions 16, 17 & 18	New computational tools and data mining

Proposed schedule

The structure of the meeting will be designed to encourage discussion and hands-on collaboration. Each day of the workshop will be devoted to a single topic, tentatively planned as given in Table 2. For this reason we will schedule ample time for lunch, to stimulate discussions.

Table 2: Proposed conference schedule

Time	Monday	Tuesday	Wednesday	Thursday	Friday
08:30-09:00	Registration/Opening	Registration			
09:00-10:40	Session 1	Session 5	Session 9	Session 11	Session 15
10:40-11:00	Coffee	Coffee	Coffee	Coffee	Coffee
11:00-12:40	Session 2	Session 6	Session 10	Session 12	Session 16
12:40-14:00	Lunch	Lunch	Workshop/Exc.	Lunch	Lunch
14:00-15:40	Session 3	Session 7	...	Session 13	Session 17
15:40-16:00	Coffee	Coffee		Coffee	Coffee
16:00-17:40	Session 4	Session 8	...	Session 14	Session 18
17:40-19:00	Poster	Poster	...	Poster	Concl. panel
19:30-22:00	Welcome	Public outreach	Dinner		

5 Venue for the Symposium

Local information & infrastructure

The alpine Mt.Blanc range and the village of Chamonix are destinations of choice for those seeking a more quiet setting for fruitful scientific exchanges, at a time when affluence is low (few tourists). The organizing committee viewed this as a key aspect for a successful first major conference sponsored by a new IAU Commission. The committee also took stock of the long history of meetings and schools held in Chamonix: examples include the IAU Symposium 182 on Herbig-Haro objects (1997) ; Structure formation in the Universe (2007); and the ASTRONUM meeting on plasma physics (2009).

The Majestic Congress center in Chamonix-Mt-Blanc is renowned for hosting international conferences on a wide variety of scientific topics, dating back to the 1980's: the then-palace was converted to host conferences and social events. The spacious building holds a large conference hall able to welcome up to 360 attendants; the two wings of the Majestic are divided in three meeting rooms (of a capacity of 90) and three discussion rooms (capacity 30); the Hall Coutterand is perfectly suited to hold both coffee breaks and poster displays. The Majestic Congress center is situated close to the center of Chamonix, with hotels and other accommodation reachable mostly by foot or using public transportation[4] The Chair of the LOC, Dr. Edouard Audit, took part in conferences held at the Majestic Congress center and has already made contact early with the on-site personnel.

[4]More details can be garnered through a virtual visit of the Majestic Congress centre.

Travel from	Train / bus	Distance	Duration
Geneva station	train	85 km	1h00
Geneva airport	train	100 km	1h10
Geneva airport	bus	100 km	1h40
Geneva	bus	108 km	2h05
Lyon airport	train	225 km	2h30
Grenoble station	train	200 km	5h30
Grenoble	bus	200km	5h30
Paris	train (TGV)	615 km	7h00

Figure 1: Top image: network access to Chamonix-Mt-Blanc, with major airports indicated. Bottom table: Suggested travel routes by train or bus. Note that private or shared buses may also be booked (fares available from the Congress Center).

Reaching the venue

The compilation on Fig. 1 sums up the most common routes to Chamonix. The LOC will provide transfer to/from the nearest international airport in Geneva to all registered participants, upon request. We expect a fair number of participants from neighboring countries to travel by train or bus.

Additional information

Public outreach events A special public conference will be held at the Majestic Congress center, in an effort to reach out to the general public and local authorities. We do not exclude to have more than one speaker, or to hold open doors for the public prior to the conference. We will seek advise from the local personnel and local authorities to figure out how to optimize its impact, especially with the involvement from PhD students and young scientists attending the meeting.

Childcare for participants. The LOC will liaise with the personnel at the Majestic to set up a childcare center during the symposium, with a view to help young families who are traveling to the meeting and make their stay more enjoyable.

Excursions, Conference Dinner The conference dinner is planned at the Majestic Congress center: details will be finalized at a later date. The LOC will remain alert to alternative offers. Likewise the number of possible out-door excursions is vast (local glaciers, trekking tours, wine tasting, ..) and easy transport secured (free shuttle buses and trains in and out out Chamonix)

which suggests it is best to remain as flexible as possible and leave the final choice to the participants. A list of pre-arranged routes / options will be handed out.

Sponsors The SOC and LOC are both actively trying to find a major sponsor from the local area. Technology-oriented businesses and academic institutions will be part of a continuing search.