



**UNIONE ASTROFILI ITALIANI**  
**- DIVULGAZIONE INCLUSIVA -**



# Good practices for astronomy inclusive outreach activities

Guidelines for the organization of inclusive  
astronomy related events and suggestions for  
approaching the world of disabilities

## Abstract

Organizing astronomy related events accessible to people with different types of disabilities requires skills that are not typical from the world of amateur astronomers. For the benefit of those aiming to put in place this type of event, in this text we give some general tips, to help organizers to reach self-confidence amongst a wide range of disabilities. Recommendations, suggestions and advices for organizing accessible and diversified astronomy related activities for different types of disabilities: sensory (visual and auditory), motor and cognitive. This text is one of the outputs developed thanks to the contributions from various territorial delegations of the UAI (Unione Astrofili Italiani), the Italian Union of Amateur Astronomers, having shared good practices, developed over their multi-year experiences.

## Authors

Andrea Alimenti, Alberto Andreis, Domenico Antonacci,  
Alessio Madonna, Andrea Miccoli, Cesare Pagano,  
UAI Working group "Divulgazione Inclusiva"

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mail to: [andrea.alimenti@astronomiapontina.it](mailto:andrea.alimenti@astronomiapontina.it)

English translation: Elena Cipollone, Fabrizio Migliorini, Cesare Pagano



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## 1. Abstract

From Article 30 of the United Nations Convention on the Rights of Persons with Disabilities: " States Parties recognize the right of persons with disabilities to take part on an equal basis with others in cultural life, and shall take all appropriate measures to ensure that persons with disabilities [...]".

As a general consideration, creating an accessible event is not meant to prepare an event dedicated to people with disabilities, but creating an event that can be enjoyed by all. It is not meant to just overcoming or knocking down architectural or perceptual barriers, but ultimately eliminate those cultural and communication barriers and prejudices that often prevent or limit people with sensory, motor or intellectual disabilities from a full participation of the event, along with other people.

Creating an accessible event means to adopt a knowhow for accessibility, not just "idle talk" but hard work to design and put in place actual, concrete, practical, logistical and communication elements, to meet the needs of all types of audience: for example, put in place mobile ramps, lifts, lifting platforms, etc; chose counters and fittings at a comfortable height for wheelchair guests, use at same time different communication solutions (text / image, text / voice solutions, etc).

It means giving people with disabilities the possibility to move and use the spaces and services autonomously, without relying on third parties.

## 2. Objective

The aim of this text is to provide simple guidelines and useful directions to organize inclusive and accessible astronomy related events for people with disabilities and specific needs. These guidelines base on previous, concrete experiences, in order to allow people to fully participate - as passive spectators or active actors - in the cultural-scientific life as expected by the United Nations Convention.

An event can be defined as an inclusive event when it allows everyone, despite their various personal needs and requirements, to benefit from the aims of the event, to live and enjoy it with full satisfaction, in the most autonomous, active and useful way for their and other people's sake. In order to fulfill this aim, it is necessary to carefully plan event activities, location and space, and their time schedule, in compliance with the principles of Universal Design.

The ultimate goal is not only to encourage for the organization of sporadic, inclusive events, but to change the overall perspective and make any scientific and especially astronomy related activity equally accessible and inclusive. Services, spaces, and activities dedicated exclusively to people with disabilities are in fact considered to be excluding and ineffective.

## 3. The 10 rules of accessibility:



- 1) Guarantee autonomy with all participants, as wide as possible: look for solutions that can give them - regardless of the type and specific needs and disability - the possibility to take advantage of environments and activities as autonomously as possible without the need for the intervention of third parties;
- 2) Plan activities by applying the Universal Design (UD) philosophy on both teaching and dissemination. A good rule of thumb is to identify design solutions that allow the user to choose the communicative mode that best suits his or her needs (ie: combine images with appropriate textual descriptions in Braille system and vocal descriptions). In the same way, provide different means of action and engagement. Think in terms of UD not only for inclusive events but for any kind of outreach and didactic activity;
- 3) Pay attention to the specific needs of the possible participants at an event. Take care of every detail, in order to respond appropriately to possible needs shown by individuals (nutrition and environmental conditions);
- 4) Always use a correct language: inclusion comes firstly and foremostly through words and terms used. Conform to the recommended and correct terms to use in your language, to avoid offending and unintentionally discriminate people with disabilities of various kinds. Likewise, avoid excessive verbal "care" that makes communication twisted and ineffective (e.g. towards a blind person you can simply say "now I'll let you see what happens when the Moon ...");
- 5) Use appropriate assistive tools and "assistive technology" (AT). Astronomy, by tradition, has always been a science strongly linked to visual, and the use of images as almost the only mean of communication. From an UD perspective, it is necessary to find alternative ways (eg tactile and auditory) to provide more suitable communication modes for different needs. This results in overcoming the limits objectively present today for people with sensory disabilities in the understanding of many phenomena. It is therefore necessary to look for, and use, useful tools to simplify and make the participation at the event (organized for everyone) more profitable. Although attention being paid to the theme of accessibility in astronomy related events increased only in recent years, there are several solutions already available on the web, often free of charge. An attentive bibliographic research is therefore recommended before starting to work and design innovative solutions. These tools must be effectively useful for a better understanding of a phenomenon. For this reason, it is often useful to have a direct cross-check with specialists in the field, or simply with those people with the type of disability faced, and by submitting them your idea or your prototype tool, to validate its actual goodness and usefulness. Often caught up in the enthusiasm for wanting to give something more, serious mistakes are involuntarily made, resulting from simple inexperience and lack of knowledge on that type of disability;
- 6) Use appropriate communication methods. The way in which certain topics can be addressed strongly depends on the different specific types of disability. In these short guidelines some initial insights are given, but a preliminary study on teaching and communication methods is always recommended before involving people with disabilities in your events;
- 7) Train all the active operators in the development of the event. For this purpose, it is advisable to organize preliminary meetings, with experts in the field, to avoid making gross mistakes during the course of events. In this type of activity, the relational aspects are fundamental, as well as a particular attention those different requirements regarding the educational aspects, services offered, possible needs, accompaniment;
- 8) Choose premises in an appropriate way: a facility hosting an event must not only meet the basic rules of architectural accessibility but also offer appropriate environmental conditions, in terms of lighting and acoustics. Avoid excessively noisy environments that may actually limit the possibilities of



communication, orientation and autonomy for people with visual disabilities. Provide appropriate lighting in the presence of people with hearing disabilities: light is necessary for an easy lipreading and the various sign languages. Arrange for the possibility to use quiet environments (quiet room) sheltered from excessive visual and auditory stimulation, to be used when needed. Arrange the interior furnishings in such a way as to ease movement and orientation for people with motor and visual disabilities. Spatial accessibility is the fundamental prerequisite in order to guarantee everyone with the possibility to move, orient themselves and enjoy the event in an autonomous, non-discriminatory and marginalizing way;

- 9) When planning activities, take into account the maximum time limit for the audience's attention, which actually turns to be typical for each of the different disabilities. Take care not to plan activities too demanding and tiring: avoid this pitfall by avoiding overrating the audience's commitment, e.g. expecting the latter could be the same commitment as yours is.
- 10) Communicate the event in a clear and accessible way. The event description must provide, in a clear and evident way, the necessary information for everyone to evaluate in an autonomous way about the accessibility of the event itself, in order to allow everyone to consciously choose whether to participate or not. For this purpose, a particular attention should be paid in the communication and dissemination of the event. It is necessary to provide an event description as clear and exhaustive as possible, based on the "plain language" rules: simple and effective phrases, avoiding technical terms, indecipherable acronyms, long and verbose sentences. Equal care must be taken in regard to the readability of the texts, using "high readability" fonts and appropriate color contrasts. Communication via web makes it easy to make the event description truly accessible to anyone: organize websites and apps according to the accessibility directives dictated by the various supranational Organizations and provide the descriptive material in various electronic formats, so that users can choose the most appropriate one for their needs.

#### 4. Types of disability and proposed activities

The typical needs of different disabilities require appropriate and diversified interventions in order to make events universally accessible. The reader is therefore now going to be provided with useful organizational ideas, divided accordingly to the various disabilities.

##### a) Sensorial disabilities

This expression mainly indicates two types of disability: blindness and low vision (for Italian Law, visus less than 3/10)(\*), deafness and hearing loss (for Italian Law, with hearing loss greater than 25 dB in both ears). Finally, the possible simultaneous presence of both disabilities: deafblindness.

(\*) In Italy, accordingly to "visually impaired" definition by Law #138/2001:

- Totally impaired: those who are affected by a total lack of vision in both eyes. Solid vision with no information whatsoever or a minimum light/shadow acuity or a 3% acuity in peripheral field of vision.
- Partially impaired: acuity not exceeding 1/20, binocular peripheral field of vision < 10% acuity.

- Severe visually impaired: acuity  $\leq 1/10$ , binocular peripheral field of vision < 30% acuity.
- Moderate/severe: acuity  $\leq 2/10$ , binocular peripheral field of vision < 50% acuity.
- Mild: acuity  $\leq 3/10$ , binocular peripheral field of vision < 60% acuity.

The above conditions would persist even when using visual aids.

For World Health Organization, please consult:



<https://www.who.int/news-room/fact-sheets/detail/blindness-and-visual-impairment>

### Visual disability

This paragraph provides useful information for those interested in organizing accessible and inclusive events with the presence of visually impaired people.

#### Activities planning:

- Identify the topic and communication path, using the method and approach typical of each outreach event. Keep in mind that, during an outreach event, you cannot expect for a real transfer of knowledge, if you have not involved the audience emotionally in the first place. In public outreach events, it's more demanding to understand "how" to say something, rather than "what" – quoting Galileo Galilei: <<Good teaching is one-fourth preparation and three-fourths good theatre>>.
- Accompany explanations and image verbalization with as many as tactile elements possible. Thus, identify those logical steps which require the use of tactile supports along with wording: in the explanation, tactile tools would replace images and videos, which are normally used for the sighted. Identify those support tools – even tactile tools, although not indispensable – which are useful to amaze the audience, engage its interest and keeping it at a high level.
- Avoid forcing concepts. Not all phenomena can be accessible by tact. When it is not possible to make a tactile model, however, an attentive verbal explanation is needed to explain what cannot be touched.
- Aim at the creation of 3D tools, even better if 4D (ie. moving) to show the evolution of the phenomenon over time. Only after having provided a 3D image of a phenomenon, and its possible temporal evolution, it is possible to take a step back and study its details also in 2D. Avoid flat models to explain complex astronomical phenomena.
- In any case, build a well-structured and tidy didactic path. At any cost, organize your speech by avoiding "jumping" from a detail, from a subject, from an image onto another, without joining them via a strong logical thread.
- Rehearse your demonstration several times, in order to select the simplest and most effective path to follow, making the continuous alternation between wording and tactile exploration fluid. Rehearse the lesson with your collaborators in order to make everyone self-confident with the instrumentation in use. Agree with your collaborators on the timing and methods of presentation. Avoid voices and multiple explanations overlapping during the lesson. Identify a single speaker who will interrupt the lesson to answer in person upfront each curiosity and question from the audience. Co-operators, as far as possible, should only accompany the hands of the participants while following the speaker's speech (very difficult to put into practice). This is an essential, to avoid creating confusion due to voices raising to overwhelm the neighbors'.
- Evaluate the maximum number of participants according to feasibility. Provide for several replicas of the same instrument, so to avoid downtime and waiting. Prefer small classes (eg 4/5 participants) in order to avoid confusion and in order to guarantee a good quality of the lesson.

#### Hints and tips:

- Keep in mind that touch, like sight, is one of the possible tools to explore and get into know the world outside, yet these two senses can't operate but following different paths. The typical "at a first



glance" operation of the sighted person does not find a counterpart in tactile exploration (haptic perception). Therefore, when presenting a tool, it is good practice to first provide a quick overview, useful to circumscribe subject; yet, the image is then to be assembled by putting together the various single details from the tool itself. An explanation of a tool or of a phenomenon, must therefore follow this path. For the primary blind (or congenital), especially if not well educated in the appropriate use of touch, the detail comes first. Using hands to quickly touch the whole instrument does not help with understanding, and generate confusion. Secondary blind and visually impaired people, on the other hand, are more often accustomed to look for the "first glance", typical of sight. It is therefore necessary to be ready to adapt one's didactic path by weighing differently (ie the time spent for) each of the two operations: deductive and inductive. However, an initial overview remains indispensable to "contain" the subject and to limit the formation of erroneous mental images.

- Recall several times those concepts (or details) explored before, to make sure that the message transmitted has been correctly received, and to give the image-to-be a more stable structure and form, by the gathering up of the various, particular details.
- During the tactile exploration of a tool, avoid calling for generic spatial directions (such as "there" "over there"). On the other hand, make good use of the fundamental concepts of topology, such as: "to the right", "2 metres ahead", "on your left hand", "at 03:00 o'clock", etc.: in this way, the movement of a blind person's hands might be directed verbally.
- Exploit, where possible, a multisensory approach. Not only touch, but also hearing. In addition to tactile exploration, also exploit the physical engagement of each participant. Use the body and body movements to strengthen concepts (e.g.: motion of the planets, apparent motion of celestial objects in the sky, etc).
- Put yourself in the shoes of those who want (and must) understand concepts using modalities different from yours. Different disabilities require accommodating different modalities and different timings: change outreach methods, change mental paths.
- Remember that, especially for the primary blind, concepts taken for granted by the sighted can be a source of misunderstandings (e.g. what is the horizon, a shadow, perspective, etc.). In the explanation, consider the time needed to deal with such concepts adequately, and do all you can to grant access to tactile support tools for help.
- Pay attention on how the participants' hands are accompanied on the various tactile tools. In every situation, always act with the greatest delicacy possible. Warn verbally or tactfully (gently touching hands) about your intention to bring the other person's hands to a certain place. During explanations, avoid abandoning the hands of the blind person unexpectedly or without verbal specifications.
- Avoid treating the person with disabilities like a child, by touching and petting him/her repeatedly. Respect the sexuality of the blind person. Pay attention to the type of touch used to lead the person's hands, avoiding misunderstandings: the touch used to lead is a delicate touch, with the fingertips, not heavy and not intrusive.
- By any mean, avoid addressing the carer in reference of the blind person, instead of to talking directly to the latter: "Would we make him/her take a seat here...?" or "Wouldn't we let him/her touch this instrument?" Address the person directly.



#### Design and implementation of tactile tools:

- Search online for solutions that may have already been invented and implemented by others. Avoid starting from scratch, to reinvent things that already exist, but start from the existing to improve it.
- Simplify the idea, to focus only on the objective to be achieved by that tool.
- Design the tool for the mechanical realization by identifying all the mechanical / electronic / economic key issues that may be present and may turn the realization of that tool impossible.
- Cross check during the design process with other experts in the field and with visually impaired "codesigners" people.
- Identify the most effective production method (handmade mechanical construction, 3D printing, laser cutting, etc.). Different materials provide different tactile stimuli and emotional sensations. Choose carefully the material to be used to make a tool (e.g. textures are like colours for the blinds. Just as we would never accept to see an explanatory picture with fuchsia and green polka dotted clouds, a tactile tool with hard and sharp clouds is not acceptable).
- Use different materials and textures to distinguish different areas of the instrument.
- Test the prototypes of the object made with reference visually impaired people and typhologists.
- Insert Braille indications on the object, necessary to allow both blind and visually impaired people to read. Braille reading helps memorizing those concepts previously explored, nevertheless for those who are not good at Braille it is worth taking advantage of new technologies to help out and simplify reading: QRcode texts, NFC, etc.: all of these are accessible to anyone by a simple smartphone.
- Record the making-of and use of the new instrument, by putting down technical notes and attaching explanatory photos and videos.

#### Event logistics organization for people with visual disabilities:

- Seek collaboration from local UICI offices, to ensure the necessary assistance to participants throughout the event, particularly during travel and transport.
- Look for an environment as quiet as possible and clear from too many objects and obstacles in the walkways, so that the participants can move around independently.
- Foresee about the possibility of guide dogs being at the event.
- Before the event, make sure to gather from each participant about their special needs. Sometimes other disabling pathologies affect participant along his/her visual disability, and that has to be considered when planning the logistics for the event.
- If it's a first event, consult with the experts of local UICI offices (before making any rash decisions).

#### Hearing disability

This section provides useful information for those interested in organizing accessible and inclusive events with the presence of audibly impaired people.

#### Activities planning

- Always provide for the presence of sign language interpreters (in Italy, the L.I.S.). The cost for interpreter fees might turn an important, but fundamental, ledger in the event budget. Provide for more than one interpreter for events lasting more than 60 minutes.





- Often, technical terms used in astronomy are not part of the sign language dictionary. For this reason with much advance of the event, it is necessary to contact the interpreter (the same interpreter who will work at the event), who will work in the meanwhile to agree on the technical terminology to be used. Therefore, the language used, and any text provided and related to the same event, must be adapted for using simple terms that are easy to understand and being translated.
- Timescales for sign language communication are slower. Arrange speeches and the event schedule by taking this into account. Particular attention should be paid to all of those situations where wording is used to describe images, videos or even direct observation of sky and constellations. In this case, in fact, the hearing impaired are compelled to direct their gaze continuously and alternatively between the interpreter and the image which is the object of the explanation. In cases like this, plan carefully in advance the whole speech, by inserting the necessary pauses as appropriate for this alternation in the vision.
- If particular sounds are to be heard, use balloons (possibly inflated with helium) to facilitate the tactile perception of the sound through the membrane of the balloon itself.

#### Hints and tips:

- Coordinate the speaker's verbal explanation along with the translation into LIS along with the use of visual media (images, videos, laser pointers during outdoor night skywatching or in planetariums).
- Check frequently about the alignment verbal speech/LIS translation, and be ready to slow down or stop when necessary.
- Give appropriate time to define new symbols and explain the new terminology.
- At the beginning of the event, agree on the meaning of any non-standard warning lights (especially for hazard warning lights).

#### Event logistics organization for people with hearing disabilities:

- Although lights are usually banned during astronomy related activities outdoor and at night, it is necessary to provide an illuminated spot, so to allow an easy vision of both the speaker's face (for lipreading) and the interpreter's signs.
- Provide an effective lighting and screen system for emergency signaling. Remember that the normal sound signals used to alert and give indications about dangers are obviously not effective.

#### b) Motor disabilities

This type of disability includes all cases of reduced and limited mobility function. Particular attention is paid to wheelchair users and the possibility of having them directly use amateur telescopes and access to observatory facilities.

#### Activities planning:

- Get yourself acquainted with wheelchair types, paying particular attention to the size and height of the observer's eye (typical eye height ranges 90-130 cm from the ground).
- Get yourself acquainted with the problems of wheelchair observation, with respect to telescope models: change display on the eyepiece to observe various objects, type of mounting and hindrance with the wheelchair, etc. In general, the simplest approach is to use retro-reflecting telescopes on an altazimuth mount, with appropriate eyepiece extensions.



- In a timely manner, arrange for optical extensions and / or modifications to the telescope mount, so to allow the eyepiece to be reached even by wheelchair users.
- Trial a few people in wheelchairs who are willing to be testers, in advance of public events.
- Select a list of astronomical objects to observe, recording their position in the sky at the time of observation. This information is needed for setting up the telescopes, and to define the most convenient observation sequence.

[Use of telescopes with optical extension:](#)

This paragraph gives practical information about the use of telescopes with optical extensions, inviting the reader to refer to the online training course for wheelchair telescope operators for wheelchair observations at:

<http://www.uai.it/stellepertutti/corso-per-operatori-di-star-party-e-attivita-divulgative-per-persone-con-disabilita-motoria/>

(currently, in Italian)

- Display the tripod frame as appropriate, accordingly to the object to be observed, so that the wheelchair can still stand next to two legs during observation;
- Determine the tripod height accordingly to the position of the objects to be observed, so that the eyepiece is at the correct height.
- When planning the time slots, bear in mind that each observation times take longer, as it is necessary to foresee the wheelchairs moving, as well as to adjust the eyepiece display and extension if necessary.
- Keep in mind that the focal length of the telescope increases due to the extensions, and therefore the field of view reduces; framing a 30'-field (Moon, sun in full) with a focal length of 2000 mm is a difficult task by any mean.
- Please note that some people in wheelchairs cannot move their head and neck, so the eyepiece must be brought into a precise position.
- Any align corrections must be performed using the finder, to limit the movement for the wheelchair. A diagonal finder, a very good alignment of the diagonal finder and a lot of experience and familiarity with one's telescope are useful for this purpose.
- In case of changing into a different extension, the focus will change a lot, too. In order to be able to automate the operations, best thing is to know the number of revolutions necessary to refocus for each extension change. It is also useful to mark with a reference, for example a small pin, on the focuser knob to be able to count the revolutions accurately.
- Familiarity with the telescope is required to quickly recover loss of focus or tripod movement with limited access to the eyepiece.
- Regarding the points mentioned above, it is necessary to prepare accurately the sequence of objects to be observed and their positions according to the observation time.
- The telescope with extension can also be used by people who do not seat in wheelchairs, so it is good not to make separate queues at telescopes, in the spirit of inclusion.



- If children in wheelchairs are expected to join the event, it may be necessary to have at least a telescope dedicated to them, since the eyepiece height should be systematically lower. Also in this case, telescope can be used by either children who sits in wheelchairs or not.
- Operating in dim light, or in the dark, requires to get acquainted with the location, in order to be able to maneuver the wheelchairs in the dark.

#### Event logistics organization for people with motor disabilities

- The place must be flat and with a suitable flooring, and obviously accessible to wheelchairs (eg. no pebbles, crushed stones, sand or fields with hollows).
- Parking: must be suitable for wheelchair users and easily accessible from the telescopes.
- Lighting suitable for movement, but compatible with observations.
- Safety: it must always be present in the operator's mind: watching out movements, the wheelchair's displacement and those of the person observing compared to the instruments and the eyepiece, must always be a priority.
- Toilets: suitable for wheelchair users.
- Evaluate a possible insurance for visitors, often available at an affordable cost.

#### c) Intellectual disabilities

In this point the term intellectual and cognitive disabilities refers to all those conditions in which there are deficits in the cognitive and / or intellectual areas. The specific needs, in view of the organization of inclusive astronomy related events, concern two fundamental aspects related to communication:

1. the individual's ability to communicate a state or need;
2. the interlocutor's understanding of the information through the communication channel used.

In this perspective, the operators thus become communication facilitators, ie they take care of facilitating the participation of people who have a different operating mode in the relationship with others due to a different cognitive or intellectual organization.

#### Hints and tips

Herewith it is considered as appropriate as to provide some points, that can be used as a basic outline in the relational mode of the operators with those persons presenting a cognitive and intellectual difficulty (from now on: user) bearing in mind that in each event it would be a good practice to:

- Check the user's communication system. This means assessing whether the user communicates differently from what the operator expects him/her to. For example, the user can communicate using single words to request what he/she wants, or use specific terms to name objects or actions, or be unclear when spelling out words. All this with the aim of trying to establish effective communication between user and operator.
- In the interaction with the user, plan for a collaboration with the users' possible companions (relatives, friends, specialist assistance, etc.), who may have an instrumental, but often also emotional role. These people can provide useful information for communication and relationship, as well as being indispensable for the user to actively participate in the event (this even more necessary if the user is a child / teen). In addition, these people can provide preliminary information useful to put in place all the necessary steps to enable the user with a facilitated participation.



- Check whether the user uses communication tools, including technological ones, and evaluate about the possibility of integrating them with the presentation methods for the various activities the event. In order to overcome possible incompatibilities, it will be useful to envisage different presentation methods for the same activity as well as to provide operators with tips for the putting in place further application solutions.
- Before presenting user with a stimulus (e.g. watching a video, audio description of actions or images, use of touch to explore objects) through a selected sensory channel, it will be the operator's responsibility to make sure that this presentation mode is easy for the user to understand. Besides, the rule of presenting the same activity in different ways will always be a valid alternative.
- Provide for the possibility of interrupting the activity or allowing the user to leave, since a negative experience could condition not only the participation in the single event in question, but also in later events, thus generating a process of generalization of the discomfort felt towards that type of activity.
- Evaluate the user's motivation and ability to participate in activities that may last over time. The duration of the activities, in fact, could be a relevant element, as the user may experience a difficulty in maintaining attention and/or a decreasing in motivation to stay longer on an activity. Also in this case, it will be good to plan about the possibility to change activities or to access a different place to continue or, in the case of having presented all the activities with the user, to put an end to his/her participation in the current event.
- Plan the activity in a timely manner and in close collaboration with those special accommodation facilities and experts in the sector. Do not improvise as educators, and follow strictly the instructions given by the experts.
- Always ask and expect the supervision from the staff of expertise from those Organization that are usually in contact with users. Do not carry out activities with intellectual / cognitive disabled without the presence of expert personnel.
- In a preliminary event evaluation phase, define in a report in writing, who is going to take care of the users, always ask whether amateurs are being required for any special activities.
- In the event evaluation phase, define in a report in writing, whom the conference talks are aimed at, whether to an open audience of guests including "cognitive able-bodied" people, or only to experts and users of the facility. This avoids the risk of receiving complaints because the conference was too difficult for users or too "boring" for guests.

#### Carrying out the activity:

- Establish a relational contact before any experience.
- Use simple language, remembering that symbolic language and humorous or ironic aspects cannot always be understood correctly.
- Take care to avoid unexpected external stimuli (sudden noises and lights).
- Don't expect to involve all participants at once, everyone has their own times and methods.
- Speak slowly, spelling out words well and also taking breaks to give them enough time to process the information.
- Accompany what is being said with simple gestures.
- Make the normal gifted children work in interaction with the cognitively disabled.
- Make the work done tangible, by the integration with the production of drawings, materials, objects that remain at the disposal of the group / class (AstroFILO, universe drawing, etc.)



#### Educational goals:

It should be noted that, particularly for this type of disability, organized activities can have a strong educational value, rather than simply outreach aspect. Astronomy can therefore become the tool used to reduce the effects of different types of disorders affecting the life of individuals, by maximizing the potential of individual users, in a real therapeutic process on a par with activities such as pet-therapy:

- Improve communication skills thanks to activities carried out in small groups;
- Improve social skills through interventions focused on relationship, reciprocity, social games where it is important to share rules, objectives, respect of shifts;
- Improve behavior by increasing young people's ability to adapt to new things, promote behavior in the interaction with others;

#### Objectives and educational activities deriving from Astronomy:

- Increased relational level. Educational activities: drawing of planets, drawing of galaxies, nebulae of our Universe, construction of models of galaxies, planets, Moon, etc.
- Improvement of physical coordination, using specific instruments such as telescopes, astronomical instrument construction, sundials, etc.
- Sharing and respect of some simple rules, social games: such as AstroFILO
- Greater opportunities for relationships and emotional enrichment for the disabled and for the able-bodied children within their school classes.

## 5. Conclusion

This guide should be taken by amateur astronomers and science communicators as a useful starting point when planning to carry out inclusive astronomy activities. However, it is once again recommended never to improvise activities of this kind without a prior duly documentation and consultation with experts in the field.

For further information consult the website (in Italian):

<https://uai.it/stellepertutti> .

## 6. Table of abbreviations

<b>UAI</b>	Italian Amateur Astronomer Union
<b>UICI</b>	Italian Blind and Visually impaired Union
<b>L.I.S.</b>	Lingua Italiana dei Segni (Italian Sign Language)
<b>AstroFILO</b>	AstroFIL (word game between “astrophile” and “fil-rouge”)
<b>QRcode</b>	Quick Response code (bar code)
<b>NFC</b>	Near Field Communication