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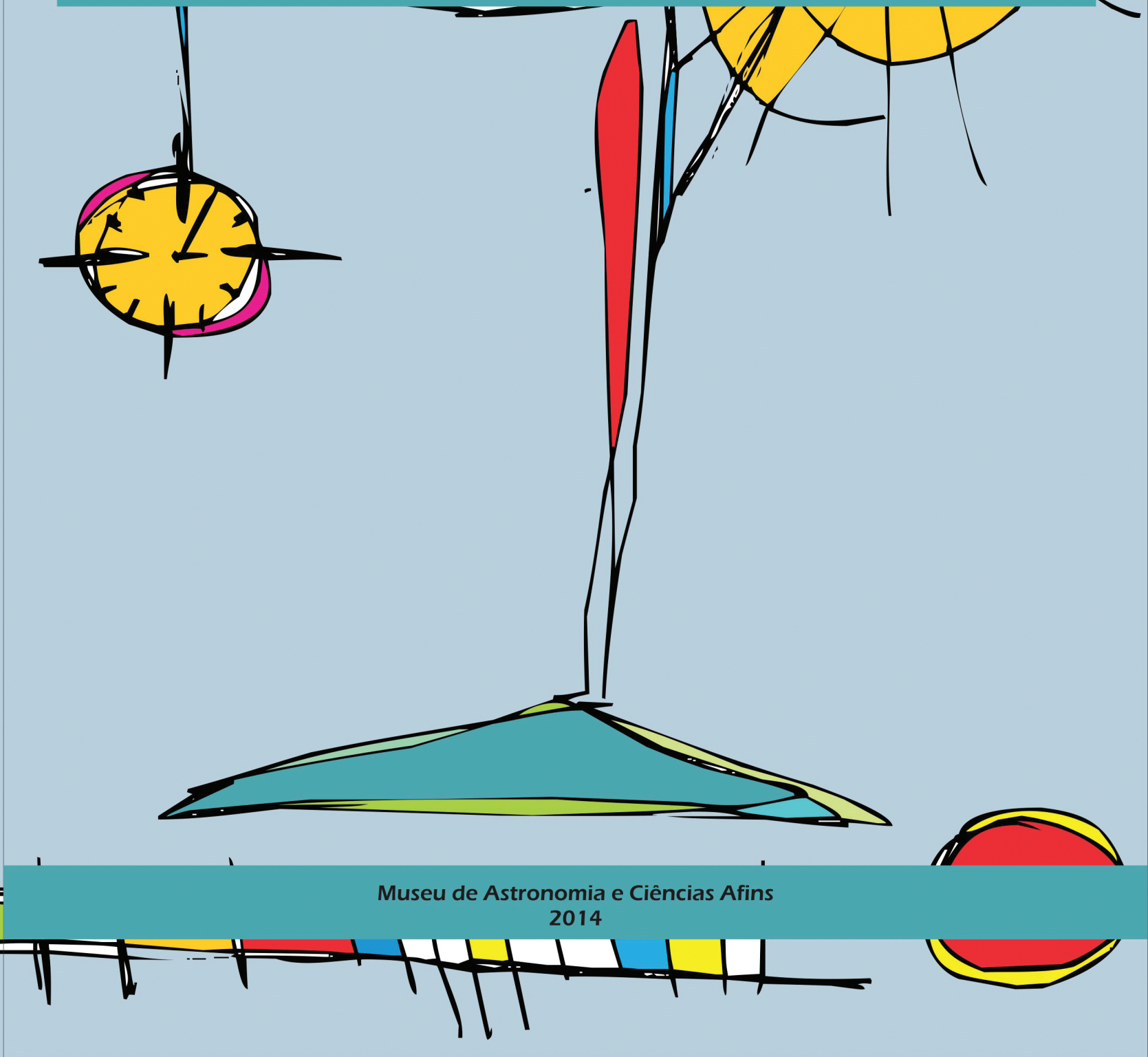
GENERAL GUIDELINES FOR THE PRESERVATION OF SCIENCE AND TECHNOLOGY HERITAGE



Museu de Astronomia e Ciências Afins
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GENERAL GUIDELINES FOR THE PRESERVATION OF SCIENCE AND TECHNOLOGY HERITAGE

1 - Introduction

This booklet is produced by the Museology Department of Museu de Astronomia e Ciências Afins (MAST/MCTI), a museum of astronomy, science and technology based in Rio de Janeiro, Brazil, as part of the "Promotion of the Brazilian Scientific and Technological Heritage" project. It is part of a wider effort to support the preservation of extant sets of science and technology objects related to the research, teaching and development of science and technology in Brazil.

Prepared in partnership with researchers from the Federal University of Bahia and the Federal University of Pernambuco, the booklet aims to provide people in possession of such artefacts with information on how to protect, care for and exhibit them.

Science and technology heritage encompasses a great variety of objects – measuring instruments, equipment, machines, teaching models, demonstration instruments, laboratory log books, glassware, prototypes, instruction handbooks, manufacturers' catalogues, etc. –, whose preservation is called for by their historical importance.

There are many kinds of cultural heritage, but the type witch is being focused on here is science and technology heritage, made up of artefacts that were used in scientific research, technology development and even teaching.

Heritage is a legacy we bequeath to future generations. It should be protected so it can be experienced by others. The value of these objects lies in the history they bear, their involvement in science and technology, and even their economic value. Another aspect that cannot be ignored is the fact that they also carry emotions. Like all cultural heritage, science and technology heritage takes shape through its meanings, which nurture our knowledge.

The different sections of this booklet – documentation, conservation, exhibition, storage, safety and access, and institutionalization – contain simple, straightforward guidelines on how to protect the science and technology heritage under your institution's care.

The idea is to shed light on the value of these objects and help in whatever way possible, according to the resources available, to assure they are preserved adequately wherever they are kept.

Credits

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2 - Documentation

Key ideas: identify – record correct information – recognise

Objective: To create two kinds of records that formalise the existence of the objects using similar criteria to an ID card: 1) a list naming all the objects (whole objects, parts or fragments, accessories, etc.); and 2) a record for each object.

Recommendations:

Making the list: Make a numbered list, with each object (instrument, equipment, loose part, etc.) corresponding to a number.

Making the record: Include the following information required to identify the objects:

Registration number (sequential list, starting with 0001; 00002; 0003...);
Name of the object (technical and common);
Materials (materials the item is made of: wood, metal, glass, etc.);
Dimensions (keep the same unit of measurement: height, width, thickness, diameter);
Description and function (in simple terms);
Maker (when known);
Markings/inscriptions/labels (details of the object in the form of markings, inscriptions or tags)
Year of manufacture (when known);
General state of conservation (working; damaged; broken...);
Detailed location (institution; laboratory; depot....);
Compiler and date (person responsible for preparing the record and respective date).
Photo (of each object, ideally against a plain background and near a ruler, to give an idea of its size)

N.B: It may not be possible to fill out all the fields immediately, but they must all be contained in the record so that they can be filled out in the future as research of the object is done. If you are not sure about some information on the record, leave it blank.

- Preparing the record: when preparing the record, you must be in the presence of the object to obtain the most accurate data possible. The registration number must be written in ink on a label (durable paper) and attached to the object using cotton or nylon thread. It must not be stuck or glued onto the object because this may cause damage.

- **Related documents:** it is important to store and record (in the list/spreadsheet and, if possible, on the record) the existence of minutes, correspondence, purchase receipts, books, catalogues, handbooks, leaflets, notebooks, or any other written documentation that may be of assistance in future research into the history of the object.

- **Safeguarding the lists and records:** the lists of records and individual records must be typed, printed and kept in files in alphabetical or numerical order. In order to safeguard the information, never keep it only in digital media. It is recommended that a copy of the lists and records be made and kept in a different place from where the originals are kept.

Model Record (filled out as an example)

PHOTO OF THE OBJECT

Name: e.g. universal prismatic compass
Common name: e.g. compass (technical and common name of the instrument, machine, etc.)

Number: The same number as on the list, e.g. 0001

Materials: Materials used to make the object, e.g. metal, glass, etc.

Location: Institution, laboratory, depot, cabinet, drawer.
e.g. Gemology Laboratory, cabinet 1, shelf 3

Dimensions: height, width, thickness, diameter.
e.g. Height: 7cm; Width: 5cm; Thickness: 1cm

State of Conservation: good, moderate, poor, very poor. Working or not; damaged; broken; fragment, etc.
e.g. Object in a moderate state of conservation with some areas of corrosion, loss of paintwork and possibly some missing parts.

Maker: Manufacturer's name, when known. Not to be confused with the model. If in doubt, record the whole inscription.
e.g. Timex

Related Documents: What types of document exist and where they are kept.
e.g. Purchase receipt and instruction manual, stored in the filing cabinet in the Gemology Laboratory.

Markings/Inscriptions/Labels: Any markings or inscriptions on the object. | e.g. Inside: Timex Aqua 0024ZZ | On the lid: Geology Institute
On the back of the object on the heritage listing plaque: UFSS 23576/68

Compiler/ date: Person who recorded the data and the date.

e.g. John Smith, 20 January 2013

Year of Manufacture: Date of manufacture, when known. This information is normally contained on some related document.
e.g. 1932

Description and Function: Description of the instrument and its function in simple language
e.g. Circular compass made of a silver metal with a lid attached to the body. Red needles and black numbers. The name of the former owner (Geology Institute) is engraved on the lid, and on the bottom is the heritage listing plaque of the current owner. Appears to have been used a lot because the metal along the sides has oxidized. Instrument used to indicate direction/location/orientation.

3 - Conservation

Key ideas: clean – organise – protect

Objectives: Conserving objects of importance safeguarded as part of a collection or archive means ensuring that they are not destroyed and do not deteriorate quickly over time. Keeping objects clean is a good way of helping to conserve them, but this has to be done with care, because depending on what is done, the situation may be worsened rather than improved and the outcome will be the opposite of what was intended.

Recommendations:

- Whenever possible, wear latex gloves when handling objects.
- Cleaning an object particularly means removing the dust and organic dirt (oil, grease, etc.) deposited on it. Cleaning must be done systematically in order to prevent the accumulation of dirt. Depending on the availability of personnel and number of objects to be cleaned, it is suggested that the objects are cleaned at least once a year.
- Soft-bristle brushes and clean flannels that do not leak dye are recommended for cleaning. Removing dust has a very positive impact on the protection of objects.
- Do not use chemicals and do not use a scourer or sandpaper to polish the surface of the objects, as this may cause damage.
- If an object has wooden parts suspected of having woodworm, they should be separated from other objects and placed in a well-sealed plastic bag.
- The place where objects are stored is also important for their conservation. See specific tips in section 4 on Storage, Safety and Access.
- Labels, markings, numbers, etc. that are an integral part of the object's history should not be removed.

This is the minimum of information needed for the conservation of objects. There are many other ways to help their conservation, but they should be done under the guidance of a professional specialised in the conservation of cultural artefacts.

Cleaning kit for collections of old instruments and equipment

Material
surgical gloves
cotton wool
soft-bristle brushes
Wd40 lubricant
multi-purpose lubricant
microcrystalline wax polish (e.g. Renaissance)
Vaseline (solid white)
cotton flannel
neutral detergent for laboratory use (e.g. Detertec)
moisturiser for dry skin (for leather parts)

4 - Storage, Safety and Access

Key ideas: keep together – keep safe – control access

Objective: To prevent objects or collections from being split up and/or lost because of inadequate safeguards. When objects are kept in different spaces it is harder to control their physical integrity and ensure their safety.

Recommendations:

- Objects should be kept together in an organised manner, preferably in the same space, which should ideally be used exclusively for this purpose.
- The place where the objects are kept must be as safe as possible. Pick somewhere that can be locked, where access is restricted and properly controlled.
- The storage place must be as free from damp, dirt and pests as possible, as set forth in section **3 on Conservation**.
- When possible, keep the objects in cupboards or cabinets, or on platforms on the floor if they are especially heavy..
- The furniture used to store the objects must be robust and well-made to ensure the objects are not damaged. Cabinets and shelves should ideally be made of metal and rust-free. If they are made of wood, they must be free of woodworm.
- The objects should be distributed in the storage space according to their physical characteristics, for instance:

  - Heavy objects should be kept closer to the floor. If they are stored in furniture, make sure it can stand their weight;

  - Glass objects should be stored in boxes or other containers in such a way that they will not break if there is any sudden movement;

  - Objects with pointed ends should be kept as far away as possible from areas of circulation;

  - Objects that can roll must be shored up or braced;

  - Objects containing remains of chemicals must be kept shut;

  - Whenever possible, avoid dismantling objects for storage because it can be hard to assemble them again afterwards.

- If an object/instrument is so damaged it can no longer be identified – e.g. with over 70% of its parts missing or rusted – appraise the possibility of disposing of it.

- It is important to store individual parts, separate parts, spare parts, lenses and other components together with the instrument or machine they belong to. These parts should never be thrown away. It is also important not to group together components if you are not sure whether they belong to the same object, because this may induce misinterpretations when the object is studied and identified in the future..

- In case of chemical reagents or unknown substances:

  - Never open the container or bottle;

  - Do not store them together with other objects;

  - Ask a chemist for help in disposing of the reagents without causing harm to people or the environment;

  - Once the chemicals have been disposed of and the inside of the containers has been washed, store them with their labels.

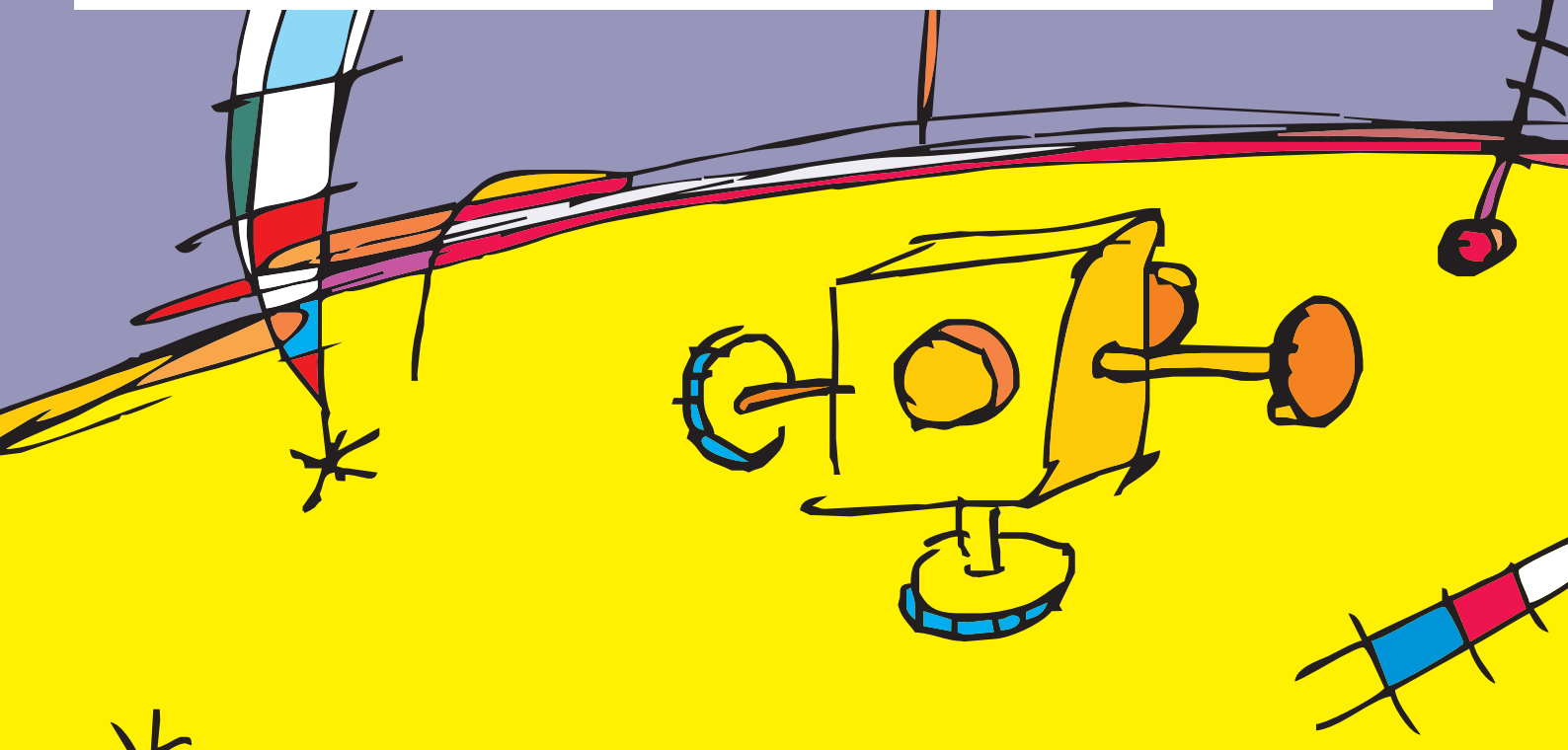
- In case of equipment that may contain sources of radioactivity:

  - Use a Geiger counter to measure the level of radiation;

  - In case of doubt, contact the International Atomic Energy Agency (+43 - 1 2600-0), email: Official.Mail@iaea.org , web site: http://www.iaea.org

- Objects may only be removed from their storage space for a limited period of time for temporary activities.

- Objects may only be removed if authorised by means of a document recording the date, the state of the object upon removal, the requirement that it will be returned and its date of return. Upon receiving objects back from loan, they must be checked to ensure they are in the same state they were in when they were removed.



5 - Exhibition

Key ideas: publicise – exhibit objects – interest people in heritage

Objective: Historical scientific instruments, equipment, machines and objects can help to tell stories, including the story of the institution they belong to. Making such objects available to the public through exhibitions is an essential part of the preservation process. It is not just about safeguarding, but of reaching out to society at large. There are different ways of exhibiting such objects, from placing them in locked display cases or cabinets, where they can be seen by people passing by, to more sophisticated presentations with appropriate furniture, exhibition panels and explanatory texts.

Recommendations:

- A good exhibition is planned in such a way as to provide a better understanding and appreciation of the objects. It should be enjoyable. Before presenting the objects, analyse the best way of organising your exhibition. It is important to group the objects around certain common points, such as their function (measuring, weighing, cutting), their age, their use in a given experiment, etc., to make the presentation easier to understand.

- It is important to consider the size of the objects relative to the total exhibition space and size of the exhibition media (cabinets, tables, display cases, pillars, showcases, etc.). It is also important to ensure they can be seen easily.

- Each object or set of objects should be identified with a standard label, which should be placed nearby. It must be legible, of a size that can be read from a distance, and contain the key data in the same order (name, year, use and function, manufacturer, markings, etc.). Ideally, these labels should be placed on the left of the object, but should never be stuck to it.

- A good tip for exhibitions is to use short explanatory texts close to groups of objects from the same area or function to give visitors a better understanding of what they are seeing.

- To improve visibility, it is best to place objects in a well-lit, safe environment (clean, without leaks, etc.), allowing adequate space between the objects and for the visitors to move around.

- The safety of the exhibition space can be ensured by following the recommendations in section 4 on Storage, Safety and Access. Exhibit objects in display cases, cabinets and other types of furniture that is protected by glass or, whenever possible, locked shut. This prevents theft and contributes greatly to their conservation.

- Prevent the unnecessary handling of the objects. When necessary, use surgical gloves.

- Avoid fixing the objects permanently (with adhesive or any other material) in the display cases or cabinets so they are not damaged.

- Keep the exhibition space clean. For cleaning the objects, follow the specific rules recommended in section 3 on Conservation.
- It is recommended that visitors receive an explanatory leaflet containing information such as: address, visiting hours, contact details, how to schedule visits, etc.

6 - Institutional Action

Key ideas: institutionalise – attribute responsibilities – prevent loss of objects in case of institutional change

Objective: To have institutions officially recognise the existence of the set or collection of objects, thereby preventing their disposal in case of institutional change. Recognition by the institution is also important for obtaining the human and material resources needed for the preservation of the objects.

Recommendations:

- The set or collection of objects should be formally recognised by the institution that safeguards them. This should be recorded by means of an institutional document, such as a directive, resolution, minutes of a meeting, or any other document the instrument uses for such purpose.

- The document attesting to the institution's recognition of the artefacts should contain:

  - identification of the set or collection of objects, ideally including a list of the objects and related documents (see section 2 on Documentation);

  - identification of the institution and sector responsible for safeguarding the set or collection of objects;

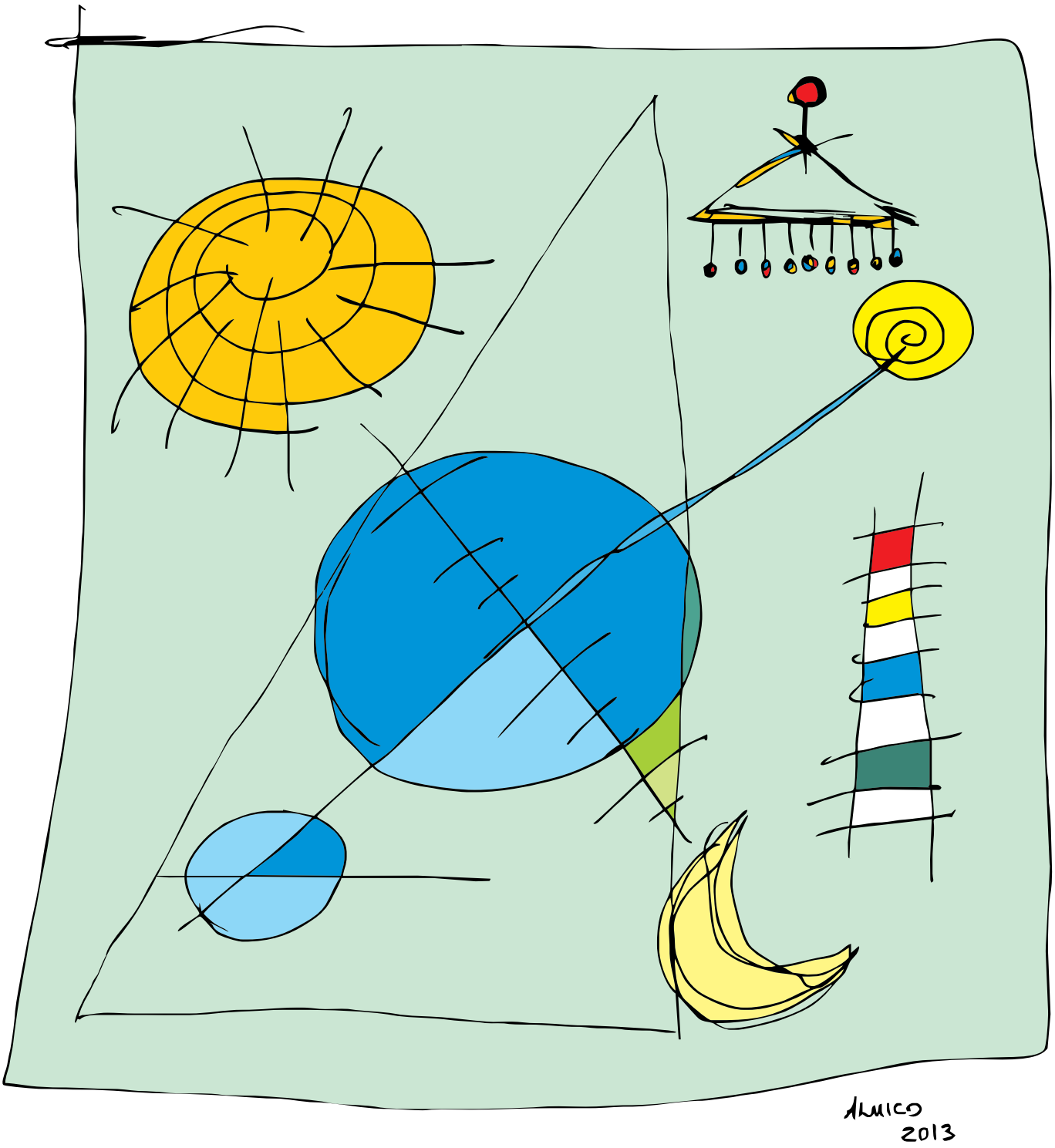
  - identification of the person responsible for the set or collection of objects and their respective position;

  - identification of the place where the objects are kept;

  - copy of the guidelines regulating the safeguard of the set or collection of objects and access to them (see section 4 on Storage, Safety and Access).

- The list of objects needs to be updated periodically, as does the institutional recognition document.

- If a full institutional recognition document cannot be obtained, there should at least be a written document assigning responsibility for the care of the objects (instruments, machines, apparatus, etc.) produced by the institution.



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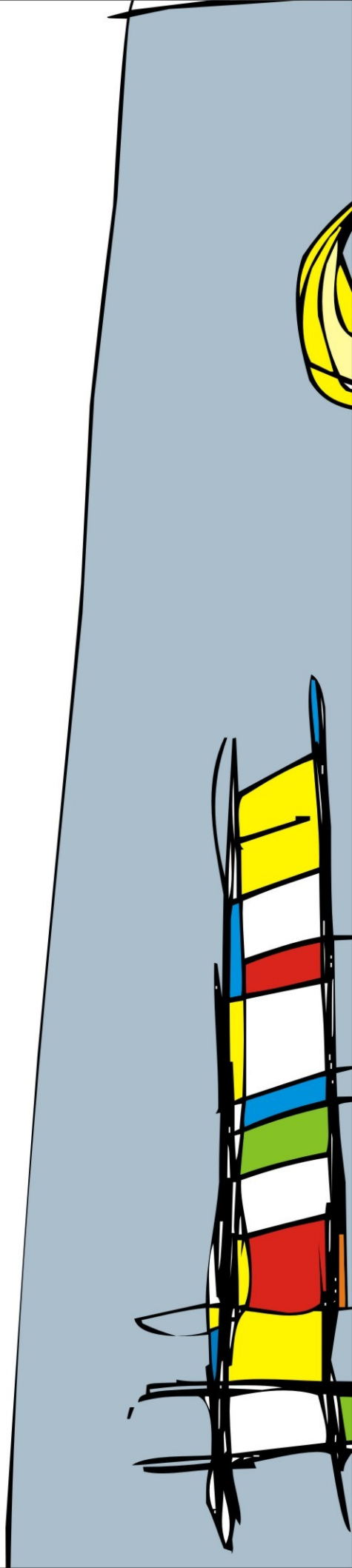

Apoio:

CNPq
Conselho Nacional de Desenvolvimento Científico e Tecnológico

Realização:

MUSEU DE ASTRONOMIA E CIÊNCIAS AFINS

Ministério da Ciência, Tecnologia e Inovação