

MIND ESCAPE OF INMATES THROUGH ASTRONOMY

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Abstract. For around twenty-five years, we have been visiting several prisons to give talks and teach astronomy and also practice hands-on activities. Information is given about the inmate population in France and how to get in contact with it. We also give technical details about what material is allowed and what is forbidden. Then, our teaching and hands-on activities are reviewed. We want to emphasize the idea that any astronomical activity in prison is very successful and useful.

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1 Introduction

In France, the inmate's population reaches nearly 80,000 people ; this fraction of the general population is largely deprived of cultural activities, a situation that most citizens tend to forget. Moreover, that population continues to increase. As of August 2024, there were 78,397 incarcerated persons for a total of about 62,000 cells (an overcrowding rate of up to 150% in some prisons). Among this prison population, the proportion of women is about 3%. Minors, aged 13 to 17, represent about 1%. So, in France, one man out of 440 is in prison. The rate of prisoners who have been sentenced is 66%, while the others are awaiting trial. It is very important that these people have access to some form of culture.

2 How to get in contact

If people wish to communicate astronomy to inmates, there are several ways to do so. The best way is to contact a teacher or professor in the school or university center of the prison. We note that the learning opportunities are very different among prisons. In the best cases, undergraduate courses exist, in connection with a nearby university. In other prisons only a very basic teaching is offered. Where a cultural program exists, the person in charge can be contacted, or else the staff of the library, if there is one. The program is seldom initiated by the prison staff itself. In rare instances, the Service Pénitentiaire d'Insertion et de Probation (SPIP) will put in place a protocol over a given period with an external organization. A few associations promoting cultural activities in prison can also be mobilized.

3 Constraints and rewards

3.1 Constraints

Of course, the schedule of the activities is very strictly defined. Sessions are more often scheduled between 2pm and 4pm. In some cases, the lecturer has to wait for all participants to be extracted from their cells by the guards. Shows shall not take place when inmates are "forgotten" by the guards or when, very rarely, they refused to get out of their cells.

The type of equipment that is permitted varies from one prison to another and often with time. The list of equipment and materials must be approved in advance. It is possible to give some paper documentation to the participants if the list is approved in advance.

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For around ten years, thirty calendars titled "Almanach du Facteur" have been kindly sent to us every year by the editor for the benefit of inmates. Extending this offer to the astronomical almanac edited by the Paris Observatory proved more complicated. Indeed, this almanac is generally bound with an iron spiral, and that form of binding is estimated to be dangerous in some prisons. In that case, the teachers removed the iron spiral and replaced it with a plastic spiral. On the other hand, for obvious reasons, we vigorously refused to give inmates the key rings showing planetary images that were suggested by the observatory's outreach office.

Computers are generally permitted, with some obscure exceptions, but no internet, no CD, DVD, or USB device. An identity check (criminal record) has to be performed two weeks in advance. Of course, all these kinds of activity were interrupted during at least two years due to the Covid epidemic.

3.2 Rewards

Several rewards can be expected:

- for the inmates, the learning experience is the best way to avoid a "waste of time" and to make the most of their incarceration to discover the Universe. Moreover, whatever skills they have already acquired, they need to be maintained through regular practice. It is important for people who are estranged from society that professionals take time interact with them and talk about their work.
- for the visiting party, we note that sharing a passion for knowledge is always a pleasure.

4 The prisons we visited

Fort the last 26 years, we made nearly one hundred visits in many different prisons:

- in the Paris area - La Santé (Paris); Bois d'Arcy; Fleury-Mérogis (the largest in Europe, both men's and women's); Fresnes (both men's and women's); Melun; Nanterre; Poissy; Porcheville (minors)
- in other regions - Angers; Laval; Liancourt (minors)
- and overseas (Ile de la Réunion) - Domenjod (both men's and women's)

5 Activities

5.1 Astronomy presentations

As it is often the case for astronomy presentations, the level of the audience is very heterogeneous. For adult inmates who try to be literate, but not necessarily in terms of scientific knowledge. We gave conferences on practically all topics in astronomy and astrophysics, from solar system objects to the large structures of the Universe. One series of conferences had a "dark" theme (dark sky, dark matter, dark energy, black holes, etc.). Certain topics were more historical: e.g. "The Origins of the Calendar", "The Golden Age of Astronomy in Islamic Lands", "Benjamin Banneker: The First Black-American Astronomer". Sometimes the audience asks for a special subject, possibly connected to astronomical news or discoveries. Discussions are encouraged at all times. We also proposed the making of exhibits within the library or media-center.

5.2 Activities inside and outside the walls

At a couple of prisons, we organized observations of a solar eclipse through a Solarscope with explanations using an Earth-Moon model. Unfortunately, or fortunately, the sky was either partially or totally cloudy. We use the word "fortunately" because no eclipse glasses were distributed to the inmates outside of our selected audience, and that would have been a dangerous situation for the unprotected observers. As usual, in these cases, a talk was anticipated as Plan B. In the case of inmates who were near the end of their incarceration, it was possible to invite them outside the prison walls for an afternoon of fun around astronomy. The permission for outings has to be given by a special judge. Firstly, we organized a visit of the Paris Observatory complemented by a picnic on the grounds and night-time observations with the Arago refractor. This Arago refractor is among the oldest astronomical instruments in the world still in use. Secondly, responding to a request from the inmates, a promenade was planned along the Paris meridian, from the observatory to a final stop at Saint-Sulpice church. Saint-Sulpice church contains an 18th century astronomical gnomon designed by the astronomer Charles Le

Monnier, as well as one of the largest organs in France, rebuilt by Cavaille-Coll. The organist of the church played a concert for these special visitors.

5.3 *Hands-on activities for teen inmates*

Teen inmates, aged thirteen to eighteen, have a very short attention span and can become restless very quickly. Conferences are NOT the type of activity they prefer. Another difficulty is that the audience changes from one session to the next. So, we devised a series of hands-on activities with a particular theme for each session. Here, we review some of our recent activities:

- using a perpetual calendar, the participants had to find the week-day of their birth;
- as a team effort, building a model of the Solar System from Styrofoam hemispheres;
- making of pocket astronomical instruments, for example a celestial map, a sundial or a spectroscope made from a CD or DVD. In that case, the CDs or DVDs could not be given to the participants because they could become weapons;
- using of a simple gravitational well made of fabric to represent space-time distortions and simulate a black hole when marbles are tossed inside the well;
- testing knowledge about the Moon, for example looking for mistakes in pictures, or inside a text;
- representing planetary surfaces with scrap materials like fabric, sand, threads, buttons, etc., each picture coming with a fact sheet;
- playing with a "Happy Families" card game containing an astronomy quiz, which was one of the most appreciated activity;
- planetarium sessions in the prison gym with an inflatable planetarium on loan from Planète Sciences, an association devoted to the scientific education of young people;
- last but not least, promoting a session on climate change: looking at causes, consequences, and solutions.

6 Conclusions

We wish to emphasize that all astronomical activities are very successful in prisons. When a series of talks that we had planned was finished, participants sometimes asked for another series. It is very important for inmates to realize that they are not forgotten by society. Moreover, it is very important not only for the inmates but also for society, that time in prison is used intelligently to foster knowledge and culture of the prison population. For the visiting astronomers, rewards far outweigh the constraints. There are many prisons in France and we encourage astronomers, either professionals or amateurs, to reach out and communicate astronomy in prisons.