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Pascal Marichalar, M. Boccas, R. Cabanac, P. Cox, E. Lagadec, Jérôme Lamy, P. Léna, C. Moutou, F. Pitout, A. Saint-Martin

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REPORT FROM THE 2021 SF2A SESSION : "THE OBSERVATORY IN ITS SOCIAL ENVIRONMENT"

P. Marichalar¹, M. Boccas², R. Cabanac³, P. Cox⁴, E. Lagadec⁵, J. Lamy⁶, P. Léna⁷, C. Moutou⁸, F. Pitout⁹ and A. Saint-Martin¹⁰

Abstract. This session was proposed and moderated by **Pascal Marichalar**, sociologist and historian at the CNRS French National Centre for Scientific Research (where he is a member of the Institute for Interdisciplinary Research on Social Issues). The session was not recorded in order to give free rein to discussions on subjects which can be touchy. The objective was to initiate a debate on the historical, political, economic, social and environmental stakes of the installation and operation of astronomical observatories on a territory - this both in the perspective of being able to continue the scientific work in the future, and with the objective of not reproducing the unequal relations with the local communities which are sometimes inherited from the past. Discussions were rich.

The starting point of the reflection was the following. Since 2014, protests have been taking place on the access road to the Mauna Kea volcano in Hawai'i in opposition to the Thirty Meter Telescope (TMT) project carried by an international consortium. The protesters, who at times numbered in the thousands, identify as *kia'i* (protectors) of the mountain, opposed not to astronomy per se, but to the logic of land grabbing and the way in which people and institutions from outside the island community decide the fate of these lands - whether for tourism, military development, real estate promotion, or scientific activity. They recall that Hawai'i was an independent nation whose monarchy was overthrown by a coup in 1893, with the support of the U.S. Navy, followed by unilateral annexation by the United States in 1898 (Hawai'i became the 50th U.S. state in 1959). One of the world's most important astronomical observation sites is thus at the center of political and social issues that reach far beyond it. In its 2021 convention, the American Astronomical Society CASCA announced that its support for the TMT (of which Canada is a potential partner) is now conditional on the Hawaiian population expressing its agreement. This important decision raises other questions, however, since under the current framework of Hawaiian government, there is no representative body of a native Hawaiian population, whose contours are themselves not clearly delineated.

The Mauna Kea conflict, which historical research shows is not new (the first protests against the development of astronomy on the mountain date back to the early 1970s), is a reminder that astronomical observatories are always built somewhere, even though site-testing campaigns usually insist on a site's remoteness from potentially disturbing human activity. The construction of an observatory supposes to make use (and take possession) of a parcel of land, sometimes of a significant surface (one thinks of the radio telescope arrays). This land is generally situated in a region which has remained preserved from the damage of human "development", because of an express will to protect the environment or because of a difficulty to exploit the environment (and often both together). In spite of the regular insistence on the "deserts" in which the observatories will be inserted, there is always a past and present human presence.

¹ IRIS - Campus Condorcet, Aubervilliers

² European Southern Observatory, Chile

³ IRAP, Université de Toulouse, CNRS, CNES, UT3, Toulouse

⁴ Sorbonne Université, UPMC Université Paris 6, CNRS, UMR 7095, Institut d'Astrophysique de Paris

⁵ Université Côte d'Azur, Observatoire de la Côte d'Azur, CNRS, Laboratoire Lagrange

⁶ CERTOP – UMR 5044 – Université Toulouse Jean Jaurès

⁷ LESIA, Observatoire de Paris, PSL, CNRS, Sorbonne Université, Université de Paris

⁸ Université de Toulouse, CNRS, IRAP

⁹ IRAP, Université de Toulouse 3/CNES/CNRS

¹⁰ Centre européen de sociologie et de science politique, Paris

The first block of interventions was centered on the case of Mauna Kea in Hawai'i.

Claire Moutou recounted some impressions of her experience as the resident astronomer of the Canada-France-Hawai'i Telescope, at a time when the first anti-TMT protests were taking place on Mauna Kea. While living there for several years allows for greater familiarity with local political and historical issues, it does not avoid uncomfortable situations where the "expat" astronomer comes to embody, for some, a history of conflict, dispossession and alienation.

Pascal Marichalar went back over the history of the access road to the volcano, from the first layout in the 1930s to the present day, showing how the question of accessibility to an astronomical observatory can be problematic. The astronomers want to be able to easily access their workplace, but are concerned about other mountain users who might come if the road is improved, and disrupt scientific activities. The opponents of the TMT recall that the road was built on "public lands trust" land that is supposed to be used for the benefit of the native Hawaiian population - finally, the road is left in an intermediate and dangerous state of progress that is not suitable for anyone.

The second block of interventions was centered on astronomical observatories in France. **Jérôme Lamy** described the history of the Toulouse Observatory in the 19th century, which was first set up at a distance from the city, but was overtaken by urbanization. The conceptions that astronomers had of their natural and social environment played a role in the way in which they occupied this space. Surrounded by an increasingly overwhelming city, Toulouse observers at the beginning of the 20th century envisaged an even greater distance - eventually heading to the Pic du Midi.

Rémi Cabanac described the recent history of the Pic du Midi Observatory. The site, at one time threatened by the budget cuts linked to the installation of telescopes abroad, succeeded in obtaining perennial financing by opening up to its regional environment. Contrary to what one might have thought, the activities of animation and use of the site are no longer thought of as detrimental to the astronomical activity, but have become on the contrary the condition of its functioning and of a relatively harmonious integration with the environment.

Arnaud Saint-Martin told the story of the first years of existence of the Haute-Provence Observatory, by making the link with the evolution of the conception of what an observatory should do (observatory of services, or of fundamental research). This history is also the one of the meeting between a remote rural environment and Parisian scientists, with perspectives on both sides on what the village of Saint-Michel (renamed Saint-Michel l'Observatoire) should become.

The third block of interventions was dedicated to observation abroad by French astronomers. **Eric Lagadec** evoked some of the projects he is part of to carry out astronomy in Africa with African astronomers. In particular, he mentioned stellar occultation campaigns in Senegal. These initiatives take as a starting point the inequality of academic and scientific means between France and many African countries without professional observatories, and aim to mitigate the effects by sharing resources, equipment, training and support to local initiatives.

Frédéric Pitout described his experience as an observing astronomer at the EISCAT ionospheric sounding and heating facilities in Tromsø and Spitsbergen (Norway). He told of the precautions to be taken in a context where electricity supply is scarce, where observations can have an effect on flights transiting through the local airport, and where the emission of radio waves has been the object of suspicion from some members of the local community, in the context of conspiracy theories but also of very real geopolitical tensions.

The fourth and final block of interventions focused on the case of Chile. Since the 1950s, this country has been invested by Western scientific powers for the development of astronomical observatories. The "convenio" governing the collaboration between ESO and Chile dates from 1964, and the first telescope at La Silla received its first light in 1969. The military coup of September 11, 1973 installed General Augusto Pinochet in power (he would remain in power until 1990). It was with Pinochet that at the end of the 1980s, the ESO negotiated to have access to a new piece of land on Cerro Paranal, where the VLT/VLTI would be built. In the 1990's, an important legal conflict almost caused the project to fail: a Chilean family claimed ownership of the land that Pinochet was not allowed to give up, there was indignation that ESO workers did not have the right to unionize, and the Chilean scientific community demanded preferential access to the telescopes, as was already the case for observatories managed by the United States. The agreement reached in the mid-1990s allowed the partnership to be redrafted on a sounder basis.

Pierre Léna shared his experience of the history of relations between ESO and Chile, from the 1970s to today, which he followed closely as one of the founding fathers of the VLT. **Pierre Cox**, as former director of ALMA, spoke about the importance of the ancient presence of the Atacameño people and the initiatives put in place by the ALMA observatory to value their culture rather than invisibilize them. **Maxime Boccas** explained

the history of the recruitment policies of engineers and technicians by the ESO in Chile, and the concern to have a balance between "expats" and Chileans, less and less difficult to reach because of the development of higher education in the country, and truly competitive salaries.

At a time when Chile is beginning an unprecedented constitutional process, and as the construction of the ELT has begun on Cerro Armazones, the partnership between European astronomers and Chile seems to have reached a more egalitarian stage than in the past - but a lot still remains to be done, notably because of the blatant economic and social inequalities that still exist.