

The naming of minor planets: multicultural relationships

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Abstract. To date, among the hundred or so minor planets we discovered with various instruments around the world, twenty of these objects have been definitively numbered and named. We have chosen the names according to our centers of interest. In honouring people in domains as varied as astronomy, astronautics, music, paleontology, comic strips, ... we had the opportunity of establishing fruitful relationships with a large horizon of cultures. It was also a good opportunity for the diffusion of astronomy towards other communities.

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1. Introduction

The tradition of naming minor planets is as old as the research itself. When the first asteroid Ceres was discovered in 1801, the question of its naming arose well before its orbit was perfectly established. The debate was lively and because this object has an orbit quite similar to the planets' ones, it was decided to carry on the tradition of naming it according to a character stemming from the Roman mythology. The subsequent discoveries followed the same rule until the near exhausting of the Roman pantheon. Names coming from other mythologies appeared then, from Greece, Egypt, Mesopotamia, and progressively from other continents due to the development of the discoveries made all over the world. It was decided that some grouping of names had to be specially reserved for specific families of objects: (1) Egyptian gods for Aten type objects, (2) heroes of the Trojan war for objects orbiting around the 1:1 resonance with Jupiter, (3) Centaur names for objects with perihelion distance beyond Jupiter, etc. Due to the rapid increase in the discovery rate, the usage of profane names by discoverers wanting to honorate their city, their friends or their relatives, and eventually their donators, also increased.

Debates are still present in the decision and acceptance of names to be given to minor planets but with time and the rapid increase of discoveries, rules were progressively established in order to keep a control on the process, to dispatch the official decisions to the astronomical community and to archive basic informations on the motivation of the discoverer(s) for giving a specific name to a specific object (Schmadel 2000). Although the very fact of naming minor planets is regularly the subject of controversy, the tradition is yet well preserved today. The small bodies of the solar system –the comets which receive the name of their discoverer(s), the satellites of the major planets and the minor planets– are presently the only celestial objects for which a procedure is settled for official naming, that is, giving them a proper name different from an identifier made with coordinates or numerals in sequential order. Because it is endorsed by the International Astronomical Union (IAU), it is thus considered as a scientific and objective process independant of any matter of business.

Before presenting our discoveries and the names we gave them, we must first describe the logical and technical process an observer must follow before becoming a discoverer and therefore earning the right of naming a minor planet.

2. Discovery and naming procedure

The first observer of a minor planet is not always the one who will have the privilege of naming it. The full process is described on the web pages of the Minor Planet Center (MPC, <http://www.cfa.harvard.edu/iau/info/Astrometry.html>). We have discussed the methodology for asteroid hunting in previous papers including observations made either in our private observatory (Merlin 2001) or with a remote telescope we used in the last four years (Merlin & Merlin 2006).

The successive steps for naming a minor planet can be summarized as follow :

(a) Qualifying the observatory. The MPC must be duly informed of the observatory geographic position and equipment description a series of astrometric measurements on an already numbered object has to be sent to the MPC for validation of the accuracy of the results and the attribution of an IAU station code.

(b) Detection of a new object. Any observer claiming for a new discovery must report several accurate astrometric measurements, typically three positions during one night, made with reference to a standard astrometric catalogue of stars and according to an official format report.

(c) Confirming the object. Any tentative “new” object has to be confirmed a second night, preferably the following night. The confirmation can be made by another observatory.

(d) Attribution of a temporary designation by the Minor Planet Center. A temporary designation is given by the MC to any “new” object. This does not mean that it is the first time that the object is observed, only that no object with an accurate long arc orbit is apparently known at this position.

(e) Follow up astrometric observations. Subsequent observations must be performed in order to not loose the object. Ideally, observations during a half dozen nights spread over 2 months allow us to obtain a good orbit with perturbed elements.

(f) Identifications with other oppositions. The MPC proceeds regularly to searches for identifications of minor planets currently observed with positions of the same objects observed at previous oppositions. When objects are recognised as multiple-opposition, the temporary designation which has the better arc (better accuracy of the orbit) becomes the principal designation.

(g) Qualifying the orbit as sufficiently accurate. The MPC has defined criteria which permit to consider that the orbit of a minor planet is sufficiently accurate and thus ready for definitive numbering. Generally, at least 4 oppositions are required and the orbital elements must permit to determine the ephemeris of the object with an accuracy within 1 arcsec over the next 10 years.

(h) Numbering the object. Every month, the MPC publishes the list of minor planets definitively numbered, the discovery is officially attributed to the observatory and the involved discoverer(s) associated with the principal designation.

(i) Submission of name proposal to the MPC. The official announcement of the numbering opens the right for the discoverer(s) to submit a name proposal. The proposal must be sent to the MPC according to an official format report. Some rules are established for the name itself:

- as short as possible
- 16 characters maximum

- not already attributed and not too similar to an existing name
- neither hurting nor injuring
- no political or military event or individual unless 100 years have elapsed
- the name must be accompanied by a four lines citation written in English

(j) Agreement of the CSBN and official publication of the naming in MPC circulars. The MPC forwards the proposals to the Committee on Small Body Nomenclature (CSBN) on a two months basis. The CSBN reserves the right to edit the name and the citation for publication. New names and citations are published in the monthly batch of MPC circulars.

The privilege of naming is most of time reserved to the official discoverers as recognized by the MPC: this applies either to professional or non-professional observers involved in the process of discovery. The process of minor planet naming is now under the control of the CSBN, a committee of 15 “wise people” emanating from IAU Division III (see <http://www.ss.astro.umd.edu/IAU/csbm>). The CSBN has always the last word. Indeed, we don't name our discoveries, we propose a name to the CSBN and the CSBN does accept it or not, eventually rejecting improper names or suggesting some modifications in the name or in the citation.

3. Our discoveries

After nearly 20 years devoted to comet observations, visual magnitude estimates, imagery and astrometry, the use of CCD opened for us the opportunity of easily discovering minor planets. The use of our 40 cm reflector established near Le Creusot (IAU station code 504) allowed us to discover 20 minor planets from 1997 to 2003. The first two discoveries were by-products of an astrometric routine program devoted to comets. In 1999 we decided to turn essentially to minor planet search and the following-up of our discoveries.

With the rapid progress of the surveys programmes, it became clear in 2001 that it was wise to seek other solutions for hunting rather than spending hours of non-sleeping time at a telescope. Several stays in observatories managed by non-profit associations and rather well equipped for that time with 60 cm reflectors helped us to learn and practice new technologies : computer-driven telescopes and cameras and automated planning of observations. Late in 2001, we discovered two minor planets with the Telescope Jean-Marc Salomon, a 60 cm reflector established by the *Planète Sciences* association in the forest of Fontainebleau (IAU station code 199) and mainly dedicated to public education and amateur training (see <http://www.planete-sciences.org/astro>).

In 2004, the ever-increasing number of discoveries and power of the surveys made us ponder on setting up a complete new automated observatory. The following questions had to be addressed: (1) the cost of such an investment (at least 50 k€ for a competitive equipment); (2) the time required before it becomes fully operational; (3) the risk of being very quickly outdated; (4) our real needs in terms of observations.

The development of remote automated and more-or-less fully robotic telescopes seemed to offer a more adapted solution to our needs. We were motivated by making some more discoveries but without the idea of beating any record. It was rather like practising a sport at a good level but without any idea of competition, a way of staying into the course with a regular contact with today's astronomy, a good knowledge of present technology and an eye opened towards the future. We estimated that few hours of observations every month were enough for our purposes. The solution came naturally when we discovered the services offered by the Tenagra Observatories (see <http://www.tenagraobservatories.com>). They were ideally suited to our needs.

The Tenagra II station has been established by Michael Schwartz in the Sonoran desert near Nogales, south of Arizona (USA, IAU station code 926). It offered for us several great advantages comparatively to other remote observatories available for amateurs : (1) it owns a 81 cm reflector fully operational and a modern powerful CCD camera the equipment (hardware and software) is regularly improved and maintained operational and updated; (2) the observations are planned by a scheduler software, which permits to sleep when the telescope is working; (3) the invoicing is based on an hourly rate: we pay when we observe and we can stop whenever we want.

In January 2005 we discovered more than 70 minor planets with the 81 cm Tenagra II reflector, including a Hungaria-type object and a Jupiter Trojan, officially the first Trojan ever discovered by a French amateur.

To date, 20 of our discoveries are numbered and named, including 11 objects discovered at station 504, 2 objects discovered at station 199 and 7 objects discovered at station 926.

4. What are the names of our minor planets ?

It is a quite rare privilege to have the opportunity of naming officially a celestial body. Only a few hundreds observers over the world have today a such privilege and they obtained it essentially because they have been officially recognised as discoverers. The first motivation when we name a minor planet for a place or for a people is to provide pleasure and happiness to individuals or to a selected population. It is a way of distinguishing something or somebody we like, respect or admire.

Every first minor planet we discovered in a place has been named after the observatory itself :

- 10233 Le Creusot for our own private observatory, it is also our home city;
- 125592 Buthiers for the place of the *Planète Sciences* observatory in the forest of Fontainebleau;
- 155142 Tenagra for the Tenagra II station in Nogales (Arizona).

It was a way of honouring all the people who were involved in the conception and building of these observatories.

Of course we have been particularly attached to honour very near relatives who help and support us daily in our astronomical activity :

- 15042 Anndavgui for the discoverer's wife Annick and their two sons, David and Guillaume
- 37044 Papymarcel for the father's discoverer, the main artisan of the building of Le Creusot observatory.

The following names have been given for honouring places and remarkable people from our home region :

- 88795 Morvan for the northern part of the Massif Central mountains in France;
- 135268 Haigneré for the astronauts Claudie and Jean-Pierre Haigneré; Claudie was born in Le Creusot;
- 158222 Manicolas for the violonist Marie-Annick Nicolas, also born in Le Creusot;
- 184275 Laffra for Maurice Laffra, the founder of Le Creusot *Orchestre Symphonique* in 1920.

We honoured a handful of amateur astronomers who had a special rôle in our career :

- 25625 Verdenet for Michel Verdenet, a French amateur who inspired many amateurs including the present author;
- 67979 Michelory for Michel Ory, a Swiss amateur who helped us many times in the follow-up of our discoveries;

- 125718 Jemasalomon for Jean-Marc Salomon whose name has been given to the Buthiers observatory's 60 cm reflector.

We also bent on honouring Marcel Bleustein-Blanchet who established the Fondation de la Vocation in 1959 (see <http://fondationvocation.org>). This foundation helps young people in their vocation by annual prizes in various domains (arts, literature, medicine, sciences ...). We received a such prize in 1982 thus helping us to begin the construction of our private observatory in Le Creusot : 99262 Bleustein

We honoured several other laureates of this foundation : Michel Verdenet, Marie-Annick Nicolas and also the internationally known paleoanthropologist Yves Coppens, co-discoverer of Lucy, the *Australopithecus afarensis*: 172850 Coppens

We have also honoured characters and people from the artistic domains :

- 98494 Marsupilami for the character created by the Belgian cartoonist André Franquin in 1952;

- 110393 Rammstein for the German hard-rock metal group;

- 157747 Mandryka for Nikita Mandryka, a cartoonist born in Bizerte (Tunisia);

- 181627 Philgeluck for the Belgian cartoonist Philippe Geluck;

- 184878 Gotlib for the French cartoonist Marcel Gottlieb.

Our Trojan minor planet has been named of course after a hero of the Trojan war : 181279 Iapyx for the healer of Aeneas during the Trojan war.

5. What is in the names of other minor planets ?

The observers involved in great surveys programs have not much time for naming all their discoveries. The LINEAR program has something like 100,000 numbered minor planets to its credit and it is not even sure that all these objects will ever be named. Choosing a name and preparing an adequate citation can be very time consuming if this must concern hundreds or thousands of cases. Generally, professional observers tend to honorate members of their team and technicians or engineers involved in the success and development of their equipment. Because they make less discoveries, amateurs have less difficulties to find names, they are more motivated to push the procedure to its end. Among the names officially announced and published every month in the MPC web pages (see <http://cfa-www.harvard.edu/iau/lists/NumberedMPs.html>), we note some general trends which are quite similar to our own choices : (1) friends and relatives, (2) cities and places of the discoverer's vicinity, (3) famous people of the discoverer's region.

We note also that some observers have chosen a speciality : (1) cities, places or people from a country they specially like and not necessarily their own one; (2) flowers and vegetal species; (3) contemporary musicians and bands; (4) mathematicians ...

The naming of minor planets is not mandatory. Globally, there are more than 200,000 numbered minor planets and only 15,000 or so are presently named. The list of names and citations can be considered as a glimpse of our civilisation. Its multi-cultural aspect can be considered as an homage to humankind and its achievements. Every discoverer can let his or her imprint in the sky by choosing names illustrating his or her culture and centers of interest. We'll see below how we tried to extend the emotional aspect of honouring people to a larger relationship together with an attempt to contribute to the diffusion of astronomy.

6. Communication and education

All individuals or communities we have been in touch with following the announcement that a minor planet was named after them have always felt that as a great honour and

with a great respect. We have systematically communicated full informations regarding the discovery circumstances, the instrument used and the official aspects of the IAU's naming procedure. Our messages were always accompanied by a link to a web page giving an official view of the naming announcement and a short animation showing the motion of the involved minor planet on the star background in order to give an idea of what those objects were looking like in a telescope. This has always been much appreciated and lead either to direct meeting with the involved people or to many exchanges for more explanations about the technique and scientific implications :

- how these objects were discovered ?
- where are they coming from ?
- are they really “new” when we discover them ?
- how can we sure that they were “new” at the time of discovery ?
- is there a strategy for hunting minor planets ?
- which equipment do we use ?
- how far are these objects ?
- at how many “light years” are they from the Earth ? (sic)
- can we see them tonight ?
- what do they look like ?
- what are they made of ?
- could we live on them ?
- what is the intensity of the gravity at their surface ?
- do they risk to impact the Earth ?

All these questions gave us wonderful opportunities to speak about astronomy with people who have really good things to learn us about their own vocation and speciality. The fully non-profit aspect of the naming of minor planets is of great concern to everyone. The emotional aspect in honouring somebody in that way and giving him or her the surprise of the announcement when it is already official lead to very fruitful exchanges and access to other horizons of human culture and civilisation. We open the curiosity of many people to astronomy and can envision other links between astronomy, the cultures and the society. The innocent questions of people non-initiated to astronomy are like children's questions, they are of great interest for finding a pedagogic introduction to astronomy and its techniques.

Some good examples of such a type of exchange are visible on web pages either created by the MPC or by the moderators of various communities, see

- Rock & Roll Minor Planets: <http://www.cfa.harvard.edu/iau/special/rocknroll/RockAndRoll.html>
- Minor planet Rammstein: <http://www.planetrammstein.com/news/old-512-un-asteroide-nomme-rammstein.php>
- Minor planet Marsupilami: http://www.marsupilami.com/site/fr/index.php?pg=actu_20050922

Great insistence is always drawn on the official aspect of the announcement.

It must be also noted that anyone can make proposals to the CSBN for naming as yet unnamed minor planets which were numbered more than ten years ago. After that time interval, the discoverers have not the priority in the privilege of naming their own discoveries. Of course, one must follow the official procedure and rules established by the CSBN (short names, citations in good English, etc ...). Either for discoverers or non-discoverers, we can suggest the idea of naming minor planets for cities which act in the way of protecting the night sky. The International Year of Astronomy (IYA) may provide a good opportunity for a large outreach operation in this topic: astronomers, discoverers or not, could take the advantage of IYA 2009 for naming a large number of yet unnamed

numbered minor planets. It could be the opportunity for honouring people who make efficient communication operations towards the public.

Astronomers have a great responsibility into the public's education, especially in the delimitation between what we know for sure and what we don't know presently. It is very important to help the public to make the difference between science and fiction, between scientific images and numerical simulations and between facts, hypothesis and theories. Providing the complete scientific and technical thought process they followed, minor planet discoverers can bring a great contribution for helping non-initiated people to understand today's science.

7. Conclusion

Naming a minor planet after someone or some place we like or admire is a nice way to make people happy. We don't ask for anything in return except a word of thanks and the happiness on people's face. If the main objective of naming minor planets is above all to provide an identification for these objects, it is not prohibited to use this rare privilege as a way of showing gratitude to people who represent something important for us. We have also in that way the opportunity of making an interesting communication operation. We can suggest to discoverers the idea of awarding cities which act in the way of protecting the night sky.

The International Year of Astronomy (IYA) may also provide a good opportunity for a large communication operation. It could be the opportunity for honouring people who make efficient communication operations towards the public.

It must be also noted that the fact of suggesting names for minor planets is not essentially reserved to the discoverers. Assuming that the IAU procedure is duly applied, everyone can make a proposal for minor planets which were numbered a long time ago. National or large amateur associations and clubs could take in hand the process of preparing citations for selected people and organisations in order to ensure the required application of IAU procedure and rules.

It is important to make well-argued choices. Within few centuries, many of the small bodies of the Solar system will be explored by spacecrafts. The names will be back on the scene. They will witness of the spirit of our time. We consider also that the fact of carrying on the naming tradition is an expression of our will to prevent the procedure from falling into private hands.

Like all other scientists, astronomers have a responsibility into public's education in explaining their methods and techniques and the present state of the art of science. Being swamped with spectacular news more or less understood by the intermediaries, the public is in need of rational information. Minor planet discoverers have an important rôle to play for contributing to the diffusion of astronomy toward non-initiated communities. They have a concrete experience of practising science and they know the limits of our present knowledge. We only hope that each of the honoured people can become an ambassador of astronomy in his or her domain.

References

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