



# Objectif Sciences

Centre de vacances scientifiques de Prabouré  
63660 Saint-Anthème (France)  
<http://asso.objectif-sciences.com>

## ***SYRTIS MAJOR PROJECT (SMP)***

### Participants:

Eric Leban	Age 15 ½
Fanny Lecot	Age 16
Julien Quévy	Age 13 ½
Alice Soubrane	Age 13 ½

and their scientific educators:  
Guillaume Marie (Ph.D of geomorphology)  
William Gras (engineer student in geology)

Contact: [guillaumemarie@yahoo.com](mailto:guillaumemarie@yahoo.com)

To B.A. Smith,  
Chairman of the I.A.U. Mars Task Group  
PO Box 649  
Tesuque, NM 87574-0649  
U.S.A.

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**Object: suggestion of nomenclature for features on the *Syrtis Major Planum* area**

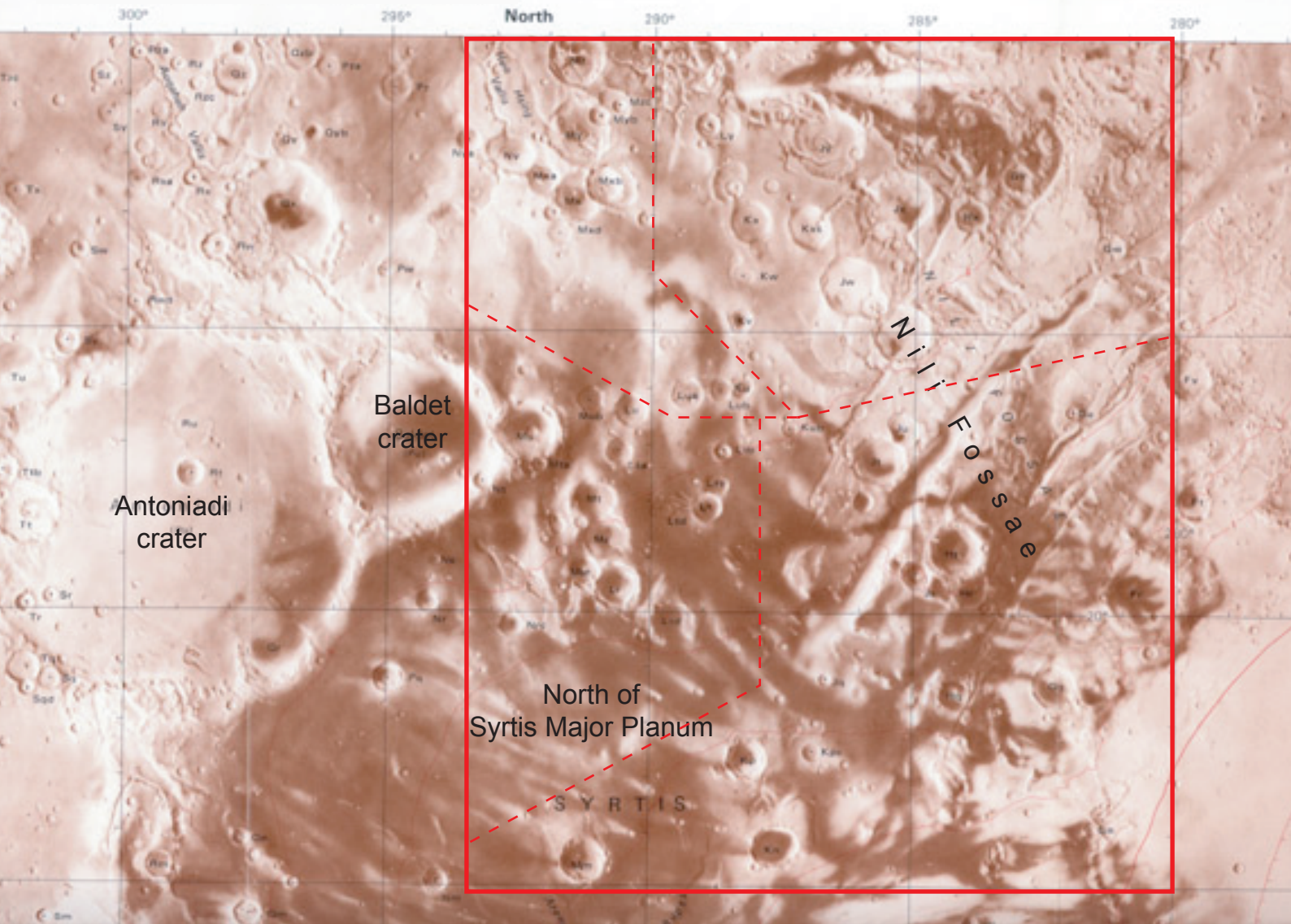
Dear members of the I.A.U. Mars Task Group,

We are four French teenagers who worked on a research project we called "Syrtis Major Project", helped by two scientific educators, on the occasion of a scientific summer camp of planetology of the association "Objectif Sciences". The objectives of the project was to understand the origins of Earth and the shaping of the landscapes by the study and the astronomical observation of planets and other celestial objects, with a particular attention to Mars where satellite images have been examined to recognize the landforms and to determine, on a specific area, a nomenclature for the different features.

We wanted to do research on Mars because we are very interested in astronomy and geology and we wanted to discover more about it. We chose to work on the Northern part of *Syrtis Major Planum* because it is a place which is not so much studied. Moreover, this area is very cratered and near the famous *Antonaldi Crater*. We divided the area of study into four sections we shared between us (*cf.* map).

As required by the I.A.U. rules, we gave names of towns having less than one hundred thousand residents to the craters. Some of the toponyms are towns where we live, one of them is the town where we spent our vacation, working on Mars geomorphology, and others are towns we especially like. We also gave to several craters the names of towns which have nearly the same geographical coordinates on Earth.

## Area of study and different sections



Source: extract of the USGS Map 13 (Syrtis Major)



Satellite image of the area

## Researches on the Universe:

Before studying in particular *Syrtis Major Planum*, we wonder about the Universe by learning, with our educators, on quantic physics, history and chronology of the Universe (formation of the Universe and origin of the Big Bang) and finally geology and planets composition.

What we did in quantic physics allowed to us to understand how the Universe has been built, the matter composition, gravitation and different assumpts about the future in the Universe. We also studied different materials, their formation and the state where we can find them. Then, we learnt how astronomers can detect matter or gases of other planets or of stars from the Earth with professional materials (telescopes like the VLT).

During the night, we were also looking at the sky to study it. We could see the Moon, Venus, Mars and the different constellations with telescopes.

## Mars morphology:

To study Mars morphology and especially the morphology of *Syrtis Major Planum*, we began by searching pictures of the surface of Mars on the web (ESA and NASA sites). We also study pictures selected before the summer camp at the "Photothèque Planétaire d'Orsay" (Orsay planetary picture library - Regional Planetary Image Facilities) of the University Paris Sud (UMR 8148 IDES - CNRS). We interpreted the landforms to determine the actual or past morphogenic agents. For example, we noted that in the past there were liquid flows, underlined by the *chasmas*. An other morphogenic agent is the wind which erected the dunes.

Then, we studied the geomorphology of the *Syrtis Major Planum* area and we looked for the appropriate feature name to describe the landforms. As the satellite images interpretation was sometimes quite difficult, we also studied the geological and topographic maps which correspond to our area. That is how we succeeded in analysing the morphology and in explaining its formation. Then, we realised scketches of the topography and of the level of degradation (thanks to the geologic and topographic maps). We noted the *Syrtis Major Planum* has a lot of craters, but less than in the South hemisphere which is older.





Work on quantic physics



Work on Mars topographic maps and satellite images



Astronomic observations

## Toponymy:

The area we studied is bounded:

- at the South, by the latitude  $15^{\circ}\text{N}$ ;
- at the North, by the latitude  $30^{\circ}\text{N}$ ;
- at the East, by the longitude  $280^{\circ}\text{W}$ ;
- at the West, by the longitude  $295^{\circ}\text{W}$ .

We studied 48 craters and we gave them names of towns with a population of less than 100,000 inhabitants, checking the actual population on the web. We also verify if the toponym was not already used for an other form on Mars and if the crater haven't a name since the achievement of the topographic map on the web site of the USGS Astrogeology Research Program. We gave names of Egyptian gods for the four *Nili Fossae*.

All the toponyms we chose are indicated on the table below, with its code on the USGS topographic map, the country of the town, its actual population (with the source) and the arguments for this choice.

The authors thank Philippe Masson and Danièle Gaspard (Université Paris Sud - UMR 8148 IDES - CNRS) for their help.

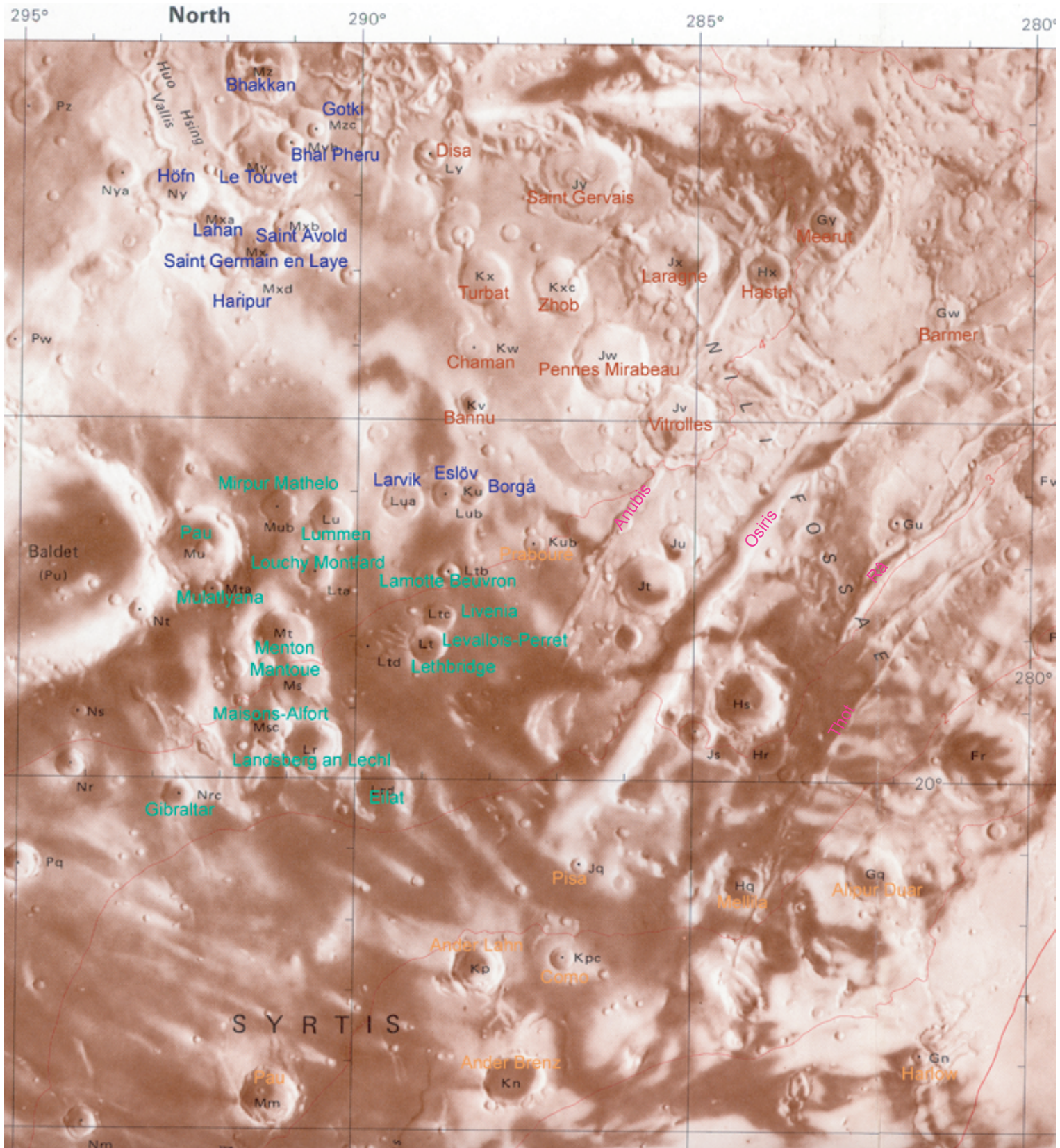
Participant	Crater code	Toponym	Country	Population in 2005	Source	Arguments *
Fanny (NE)	Jv	Vitrolles	France	38 137	city council site	1
	Jw	Pennes Mirabeau	France	19 022	city council site	1
	Jx	Laragne	France	3 306	city council site	1
	Jy	Saint Gervais	France	813	city council site	1
	Ly	Disa	India	93 117	Mongabay	2
	Gy	Meerut	India	92 101	Mongabay	2
	Hx	Hastal	India	90 729	Mongabay	2
	Gw	Barmer	India	90 050	Mongabay	2
	Kv	Bannu	Pakistan	47 412	Mongabay	2
	Kw	Chaman	Pakistan	88 901	Mongabay	2
	Kx	Turbat	Pakistan	92 864	Mongabay	2
	Kxc	Zhob	Pakistan	59 198	Mongabay	2
Alice (SE)	Mm	Pau	France	76 444	Wikipedia	3
	Kn	Ander Brenz	Germany	51 431	Wikipedia	4
	Kp	Ander Lahn	Germany	34 355	Wikipedia	4
	Kpc	Como	Italy	76 264	Wikipedia	5
	Jq	Pisa	Italy	87 531	Wikipedia	6
	Hq	Mellila	Spain	69 610	Wikipedia	7
	Gq	Alipur Duar	India	76 298	Wikipedia	8
	Gn	Harlow	United Kingdom	90 113	Wikipedia	9
Eric (SW)	Mn	Minden	Germany	85 900	Wikipedia	10
	Mta	Mulatlyana	Sri Lanka	45 972	Wikipedia	10
	Mub	Mirpur Mathelo	Pakistan	57 565	Wikipedia	10
	Lu	Lummen	Belgium	69 257	Wikipedia	10
	Lta	Louchy Montfard	France	431	Wikipedia	10
	Mt	Menton	France	28 792	Wikipedia	10
	Ms	Mantoue	Italy	47 790	Wikipedia	10
	Msc	Maisons-Alfort	France	51 029	Wikipedia	10
	Lr	Landsberg an Lechl	Germany	26 000	Wikipedia	10
	Nrc	Gibraltar	United Kingdom	29 481	Wikipedia	11
	Lrd	Eilat	Israel	50 000	Wikipedia	11
	Ltb	Lamotte Beuvron	France	4 251	Wikipedia	10
	Ltc	Livenia	United States	99 217	Mongabay	10
	Lt	Levallois-Perret	France	54 764	Mongabay	10
	Ltd	Lethbridge	Canada	72 717	Mongabay	10
Julien (NW)	Mx	Saint Germain en Laye	France	38 124	city council site	12
	Mxa	Lahan	Nepal	31 365	Mongabay	13
	Mxb	Saint Avoird	France	17 473	city council site	12
	Mxd	Haripur	Pakistan	55 945	Mongabay	2
	My	Le Touvet	France	2 822	city council site	14
	Myb	Bhai Pheru	Pakistan	73 739	Mongabay	2
	Mz	Bhakkan	Pakistan	81 468	Mongabay	2
	Mzc	Gotki	Pakistan	67 983	Mongabay	2
	Ny	Höfn	Iceland	2 293	Mongabay	15
	Lua	Larvik	Norway	41 291	Mongabay	16
	Lub	Eslöv	Sweden	29 218	Mongabay	16
	Ku	Borgå	Finland	46 439	Mongabay	16
	Kub	Prabouré	France	a dozen	The center director	17

Participant	Position of the fossae	Toponym	Arguments *
Alice	centre of the area	Osiris	18
	left of Osiris cr.	Anubis	18
	right of Osiris cr.	Râ	18
	right of Râ cr.	Thot	18

\* 1: towns I like to go or where I or relatives live ; 2: towns which have nearly the same geographical coordinates on Earth than on Mars ; 3: native town of my mother ; 4: because I regret not have visiting Germany with my junior high school ; 5: because I adore Italy ; 6: because I haven't been there yet ; 7: because I learn Spanish ; 8: because I'm native of India ; 9: I adore England ; 10: letters of the crater code in the name of the town ; 11: geographical position of the craters ; 12: town of my grandparents ; 13: because I like Nepal ; 14: town where I live ; 15: because I like Iceland ; 16: because I like Scandinavia and the three craters side by side make me think to Norway, Sweden and Finland ; 17: town where we spent our scientific summer camp ; 18: Egyptian Gods.



## Toponyms of the craters and fossae



Source: extract of the USGS Map 13 (Syrtris Major)