

Johann Palisa, the most successful visual discoverer of asteroids

Herbert Raab^{a,b}

^a Astronomical Society of Linz, Sternwarteweg 5, A-4020 Linz, Austria

^b Herbert Raab, Schönbergstr. 23/21, A-4020 Linz, Austria; herbert.raab@utanet.at

Part of the Programme of MACE 2002 was a trip to the remnants of the old Pola observatory. Among minor planet observers, this observatory is mostly known for the work of Johann Palisa. This paper provides a short biography of Johann Palisa, as well as some information about his discoveries.

Palisa was director of the Pola observatory from 1872 until 1880. He discovered 28 minor planets and one comet during that time. In 1880, he took a position at the new Vienna observatory. Here, he discovered further 94 minor planets, all by visual observations. His most famous discovery is probably the Amor-type asteroid (719) Albert. Today, Palisa remains the most successful visual discoverer of asteroids.

A short biography of Johann Palisa

Johann Palisa was born on December 6, 1848 in Troppau, Silesia (now Czech Republic) [1,2]. From 1866 to 1870 he studied mathematics and astronomy at the University of Vienna, but did not graduate until 1884. Already in 1870, he became assistant at the University observatory in Vienna, and in the following year, he took a position at the observatory in Geneva.

Only 24 years old, Palisa became director of the Austrian Naval Observatory in Pola in 1872. Pola (now Pula) was harbor of the Austrian Navy from 1850 until the empire of Austria-Hungary collapsed at the end of World War I.



Figure 1: The Pola Observatory in the 19th century.

Palisa discovered his first asteroid, (136) Austria [3], at Pola on 1874 March 18, using a 6" refractor. He subsequently discovered further 27 minor planets and one comet at Pola with this small instrument.

When the new Vienna observatory was inaugurated in 1880 by emperor Franz Joseph I, he was offered a position as "Adjunkt", comparable to a modern night assistant. Palisa gave up his position as director of the Naval Observatory and accepted the subordinate employment, only because he was able to routinely use the large 27" refractor in Vienna, at that time the largest telescope in the world. To handle this telescope of 10.54m focal length, and the dome, 14m in diameter, two assistants were usually provided to aid the observer. The story goes that Palisa

used to send his assistants to bed at midnight, but continued to observe until the break of dawn, handling the instrument all alone. Palisa discovered further 94 asteroids at Vienna, all by visual observations, using the 27" and the 12" refractor. In addition, Palisa discovered eight objects that were included by Dreyer in the NGC catalogue, as well as four nebulae listed in the IC. [4]



Figure 2: Portrait of Johann Palisa.

In 1883, he joined the expedition of the French academy to observe the total solar eclipse on May 6 of that year [5]. During the eclipse, he searched for the proposed planet Vulcan, which was supposed to circle the sun within the orbit of Mercury. In addition to observing the eclipse, Palisa collected insects for the Natural History Museum in Vienna. When he returned, he named minor planet (235) Carolina after the atoll of the Line islands, 450 miles northwest of Tahiti, where this expedition set up the instruments to observe the eclipse.

In 1885, Palisa offered to sell the naming right for minor planet (244) for £50 to raise funds for his expedition to the

total solar eclipse of August 29, 1886. Apparently, this was not successful, as Palisa did not travel to the eclipse, and the minor planet was later named after the Indian goddess Sita.



Figure 3: View of the 27” Grubb Refractor at Vienna. Image courtesy Vienna University Observatory.

At that time, there were no star charts available to support his search for new minor planets, so Palisa used to draw the maps on his own. At the end of the 19th century, Johann Palisa and Max Wolf in Heidelberg joined forces and worked on the Palisa-Wolf-Sternkarten. This work, which is the first photographic star atlas, was published between 1900 and 1908. Two years later, Palisa published his *Sternenlexikon*, a star catalogue covering the sky between declinations -1° and $+19^\circ$. In 1908, Palisa became vice director of the Vienna observatory.

He retired in 1919, with the right to continue his observations at the observatory. For his work, Palisa was awarded with the Great Price of the Paris Academy. He was also honoured by minor planet (914) Palisana, discovered and named by Max Wolf, and by a lunar crater 33km in diameter. Palisa died in Vienna on May 2, 1925. With 122 minor planets, Palisa is still the most successful Austrian discoverer of asteroids, as well as the most successful visual discoverer in the history of minor planet research.

The discoveries of Johann Palisa

Palisa’s discoveries remain targets of modern research: Minor planet (153) Hilda is the prototype of the Hilda asteroids, orbiting the sun in 3:2 resonance with Jupiter. Asteroid (216) Kleopatra hit the headlines in 2000, when observations with the Arecibo Planetary Radar found it to have an unusual dog-bone shape. In 1993, the Galileo spacecraft flew by (243) Ida, the NEAR spacecraft passed by (253) Mathile in 1997, and asteroid (140) Siwa will be fly-by target of ESAs Rosetta mission in 2008. Palisa’s

most famous discovery is probably asteroid (719) Albert. Being only the second NEA found, it was lost only a few days after its discovery. The Amor-type asteroid was finally recovered in 2000 by the Spacewatch project.

Table 1 in the Appendix lists all solar system objects discovered by Palisa, in the order of the date of discovery.

Appendix

Object Designation	Date of Discovery	Place of Discovery
(136) Austria	1874 03 18	Pola
(137) Meliboea	1874 04 21	Pola
(140) Siwa	1874 10 13	Pola
(142) Polana	1875 01 28	Pola
(143) Adria	1875 02 23	Pola
(151) Abundantia	1875 11 01	Pola
(153) Hilda	1875 11 02	Pola
(155) Scylla	1875 11 08	Pola
(156) Xanthippe	1875 11 22	Pola
(178) Belisana	1877 11 06	Pola
(182) Elsa	1878 02 07	Pola
(183) Istria	1878 02 08	Pola
(184) Dejopeja	1878 02 28	Pola
(192) Nausikaa	1879 02 17	Pola
(195) Eurykleia	1879 04 19	Pola
(197) Arete	1879 05 21	Pola
(201) Penelope	1879 08 07	Pola
C/1879 Q1 (Palisa)	1879 08 21	Pola
(204) Kallisto	1879 10 08	Pola
(205) Martha	1879 10 13	Pola
(207) Hedda	1879 10 17	Pola
(208) Lacrimosa	1879 10 21	Pola
(210) Isabella	1879 11 12	Pola
(211) Isolda	1879 12 10	Pola
(212) Medea	1880 02 06	Pola
(214) Aschera	1880 02 29	Pola
(216) Kleopatra	1880 04 10	Pola
(218) Bianca	1880 09 04	Pola
(219) Thusnelda	1880 09 30	Pola
(220) Stephania	1881 05 19	Vienna
(221) Eos	1882 01 18	Vienna
(222) Lucia	1882 02 09	Vienna
(223) Rosa	1882 03 09	Vienna
(224) Oceana	1882 03 30	Vienna
(225) Henrietta	1882 04 19	Vienna
(226) Weringia	1882 07 19	Vienna
(228) Agathe	1882 08 19	Vienna
(229) Adelinda	1882 08 22	Vienna
(231) Vindobona	1882 09 10	Vienna
(232) Russia	1883 01 31	Vienna
(235) Carolina	1883 11 28	Vienna
(236) Honoria	1884 04 26	Vienna
(237) Coelestina	1884 06 27	Vienna
(239) Adrastea	1884 08 18	Vienna
(242) Kriemhild	1884 09 22	Vienna
(243) Ida	1884 09 29	Vienna
(244) Sita	1884 10 14	Vienna
(248) Lameia	1885 06 05	Vienna
(250) Bettina	1885 09 03	Vienna



(251) Sophia	1885 10 04	Vienna
(253) Mathilde	1885 11 12	Vienna
(254) Augusta	1886 03 31	Vienna
(255) Oppavia	1886 03 31	Vienna
(256) Walpurga	1886 04 03	Vienna
(257) Silesia	1886 04 05	Vienna
(260) Huberta	1886 10 03	Vienna
(262) Valda	1886 11 03	Vienna
(263) Dresda	1886 11 03	Vienna
(265) Anna	1887 02 25	Vienna
(266) Aline	1887 05 17	Vienna
(269) Justitia	1887 09 21	Vienna
(273) Atropos	1888 03 08	Vienna
(274) Philagoria	1888 04 03	Vienna
(275) Sapientia	1888 04 15	Vienna
(276) Adelheid	1888 04 17	Vienna
(278) Paulina	1888 05 16	Vienna
(279) Thule	1888 10 25	Vienna
(280) Philia	1888 10 29	Vienna
(281) Lucretia	1888 10 31	Vienna
(286) Iclea	1889 08 03	Vienna
(290) Bruna	1890 03 20	Vienna
(291) Alice	1890 04 25	Vienna
(292) Ludovica	1890 04 25	Vienna
(295) Theresia	1890 08 17	Vienna
(299) Thora	1890 10 06	Vienna
(301) Bavaria	1890 11 16	Vienna
(304) Olga	1891 02 14	Vienna
(309) Fraternitas	1891 04 06	Vienna
(313) Chaldaea	1891 08 30	Vienna
(315) Constantia	1891 09 04	Vienna
(320) Katharina	1891 10 11	Vienna
(321) Florentina	1891 10 15	Vienna
(324) Bamberg	1892 02 25	Vienna
(326) Tamara	1892 03 19	Vienna
(569) Misa	1905 07 27	Vienna
(583) Klotilde	1905 12 31	Vienna
(652) Jubilatrix	1907 11 04	Vienna
(671) Carnegia	1908 09 21	Vienna
(14309) Defoy	1908 09 22	Vienna
(687) Tinette	1909 08 16	Vienna
(688) Melanie	1909 08 25	Vienna
(689) Zita	1909 09 12	Vienna
(703) Noemi	1910 10 03	Vienna
(710) Gertrud	1911 02 28	Vienna
(711) Marmulla	1911 03 01	Vienna
(716) Berkeley	1911 07 30	Vienna
(718) Erida	1911 09 29	Vienna
(719) Albert	1911 10 03	Vienna
(722) Frieda	1911 10 18	Vienna
(723) Hammonia	1911 10 21	Vienna
(724) Hapag	1911 10 21	Vienna
(725) Amanda	1911 10 21	Vienna
(728) Leonisis	1912 02 16	Vienna
(730) Athanasia	1912 04 10	Vienna
(734) Benda	1912 10 11	Vienna
(750) Oskar	1913 04 28	Vienna
(782) Montefiore	1914 03 18	Vienna
(783) Nora	1914 03 18	Vienna
(794) Irenaea	1914 08 27	Vienna

(795) Fini	1914 09 26	Vienna
(803) Picka	1915 03 21	Vienna
(827) Wolfiana	1916 08 29	Vienna
(828) Lindemannia	1916 08 29	Vienna
(867) Kovacia	1917 02 25	Vienna
(876) Scott	1917 06 20	Vienna
(902) Probitas	1918 09 03	Vienna
(903) Nealley	1918 09 13	Vienna
(932) Hooveria	1920 03 23	Vienna
(941) Murray	1920 10 10	Vienna
(964) Subamara	1921 10 27	Vienna
(975) Perseveranti	1922 03 27	Vienna
(996) Hilaritas	1923 03 21	Vienna
(1073) Gellivara	1923 09 14	Vienna

Table 1: This table lists all solar system objects discovered by Johann Palisa. [6,7]

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