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-  [Photo's of the Meteorite of Neuschwanstein](#) (communicated by Marco Langbroek)
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-  [Meteoritefind in Germany](#) (DLR : Deutschen Zentrum für Luft- und Raumfahrt)
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*Last updated: august 2, 2002*

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*Photo's DLR, Berlin*

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Hi All,

Slightly OT, but news is breaking that a definite 1.75 kg fragment has been found from the large bolide of April 6 over Bavaria (central Europe). So we have a new meteorite with a photographic orbit. That orbit is highly similar to that of the Pribram, another photographed meteorite fall in central Europe 43 years ago. I am very curious as to what the classification of this meteorite, provisionally called 'Neuschwanstein', will be (Pribram is an H5).

For those who read German, there is a story with photograph at [www.wetteragentur.de](http://www.wetteragentur.de). There is no doubt that this time it is real as in addition I got a few private mails from knowledgeable sources on it.

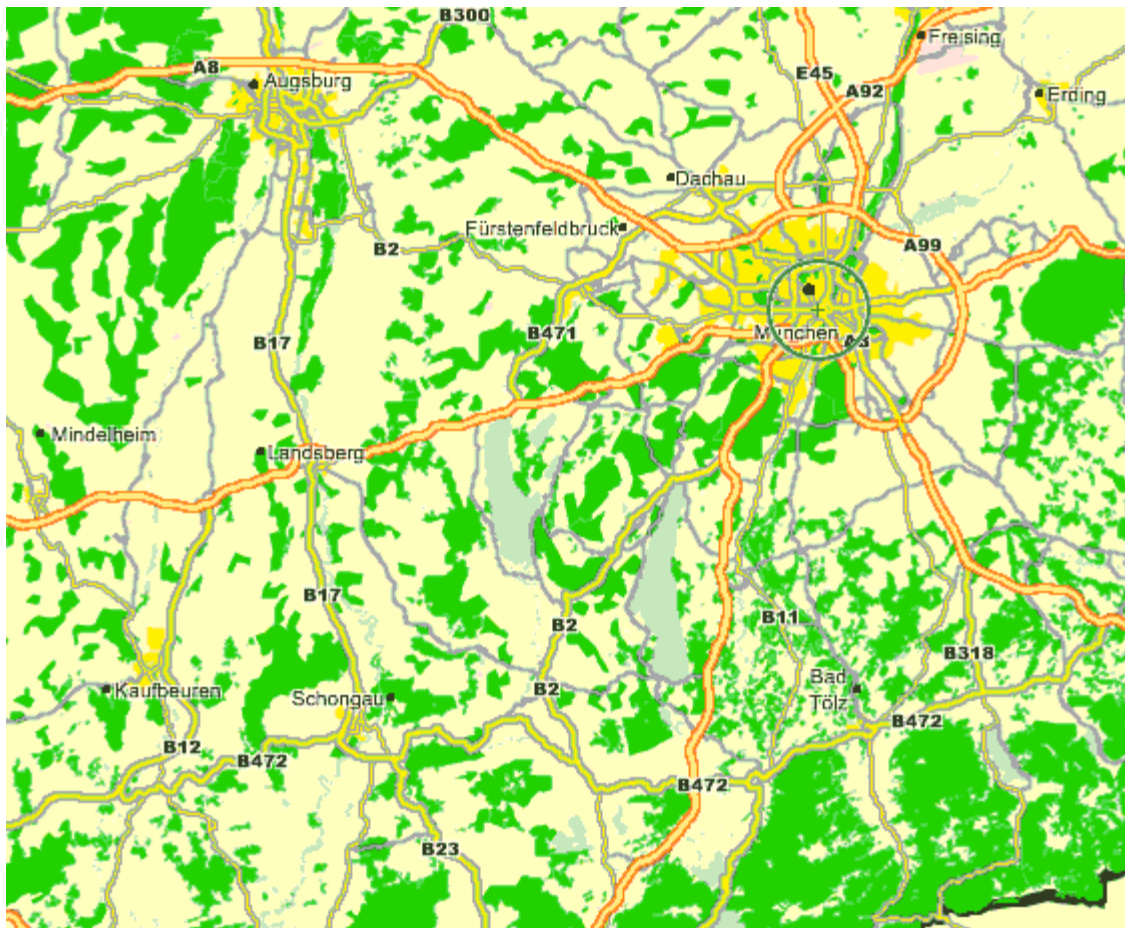
Maybe one of the German or Czech people on the list has some more details?

- Marco

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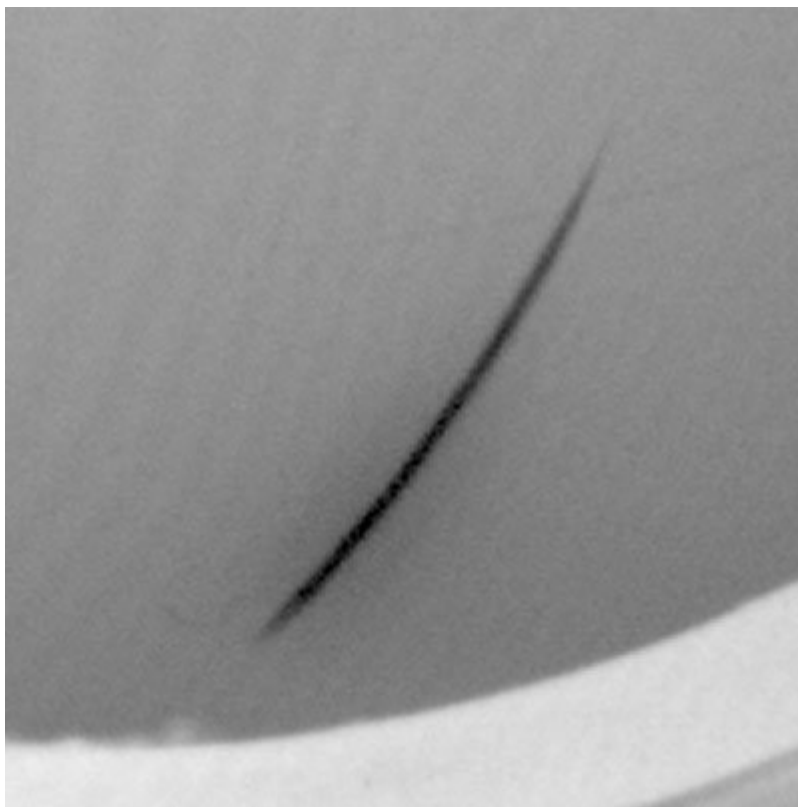
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*The trajectory of the fireball as photographed by one of the German all-sky stations*



Feuerkugel vom 6.4.2002, 22:21 MESZ  
DLR, Institut für Planetenerkundung

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[The Bavarian Fireball photographed by the all-sky kamera at the Observatory Gahberg](#)

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*This is not the meteorite which left over from the fireball-event on 2002, april 6!*



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[Infrasound website by Dr. Láslo Evers of the Dutch National Weather Institute \(KNMI\)](#)

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[Yahoo Deutschland: Mysteriöse Nachtlichter: Komet oder «Feuerball-Bolide» vermutet](#)

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[Sueddeutsche.de: Ein Falsche Meteoriet...](#)

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Hartwig Luethen on the Bavarian Fireball on Meteorobs

Junk media information on this fireball is still dominating German press, TV and broadcast, and it is still hard to separate facts from fuss. There evidently was a very bright fireball over Bavaria at about 20:21 UT. Estimates suggest a magnitude of about -14mag or brighter. There appears to have been a sonic boom in the area of Garmisch-Partenkirchen south of Munich. People who saw the fireball say it disintegrated into a number of fragments.

There is breaking news of a stony meteorite found near Erding, northeast of Munich. This report however clearly needs additional confirmation. Although a Munich geochemistry professor has stated this being "probably" a meteorite several things look rather strange. First the lady finding the stone saw the fireball "land in her garden like a firework rocket" - a typical error eyewitnesses far away from an impact make. Secondly both trajectory and the sonic boom suggest the impact area (if any) located SOUTHEAST of Munich, perhaps closer to the Austrian border. There have been eyewitnesses from downtown Munich seeing the fireball overhead, heading southward. In short an impact site near Erding does not really match to the observed trajectory (unless the stray ellipse being VERY large). Thirdly reports in the media describing the candidate meteorite looking like "slag" are not increasing the trust into that matter. But time will tell.

There is a quite dense meteor camera network operating in the region and also in neighbouring Czechia. Probably some of these shuttered all-sky cameras captured the event. This will allow a better analysis of the fireball trajectory and identification of the possible impact area.

Hartwig

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## Karl Antier on the Bavarian Fireball on Meteorobs

Hi all !

Here is a mail I received and that must be related to this event. I received it from a French mailing list on UFO, but it must be quite interesting for you too. It seems that the 7/4/2002 event is due to a space reentry. I translate the mail the best I can :

"Luminous phenomenon in "Bayern : a meteor shower ?  
Munich, April, the 7th of 2002

Mysterious luminous phenomena have been observed in the night from Saturday to Sunday in the regional Deutsch state of Bayern would be due to a meteor shower, according to an expert.

"We can definitely exclude the possibility that it was debris of a space station or the wreckage of a satellite", declared Otto Guthier, president of the Association of the friends of the stars of Heppenheim, in charged of controlling and photographing all phenomena that occurred in Deutsch sky.

"It's a fireball, a rain of shooting stars of low mass", he explained, asserting that according to the photos at his disposal, its weight was of several thousands kilograms. Mr Guthier added that he wasn't sure that this rain had fallen on earth in spite of its mass : "it could extinguish above the Earth".

Thousands of inhabitants of southern Bayern observed the phenomenon and, worried, called the local authorities all night long. Some declared having heard an explosion noise after several lightnings in the sky.

"Some windows shaken", indicated a spokesman of the local police.

According to the regional department of the Interior, around 100 000 persons would have assist to these luminous phenomena. "We don't know where it came from", indicated a spokeman of police on Sunday morning "

Ufoweb note that could be related to this event :

"Reentry in the atmosphere of a launcher and his two satellites.  
07/04 19:23 : The superior stage of a Pegasus rocket and the American satellites HETE-1 and Argentinian SAC-B which hadn't unhooked during the launch in 1996 reentered the atmosphere in the night from Saturday to Sunday, announced the NASA. The three devices weighed 535 kilos and the NASA expected that only the four steel batteries ( 15 kg in total ) would resist the atmosphere reentry  
The launch occurred on November the 4th of 1996. The launcher had hit the right altitude but the third stage didn't detach from the two satellites.  
In Bayern, thousands of people caught a glimpse of mysterious luminous phenomena in the sky, in the night from Saturday to Sunday."

This is the translated article. Sorry for all the mistakes I committed. It may not sound very "scientific", but it might help to find some witnesses of the fireball, which may be reentry satellite.  
Behind is the French article, for those who are used in reading this language.

Clear skies to all !

Karl.

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"Phénomènes lumineux en Bavière: une pluie d'étoiles filantes?"

MUNICH (AFP), le 07-04-2002

De mystérieux phénomènes lumineux observés dans la nuit de samedi à dimanche dans le ciel de l'Etat régional allemand de Bavière seraient dus à une pluie d'étoiles filantes, selon un expert.

"Nous pouvons définitivement exclure qu'il s'agisse de débris d'une station spatiale ou des restes d'un satellite", a déclaré Otto Guthier, président de l'Association des amis des étoiles de Heppenheim (centre), en charge de contrôler et photographier tous les phénomènes se déroulant dans le ciel allemand.

"Il s'agit d'une +boule de feu+, une pluie d'étoiles filantes d'une forte masse", a-t-il expliqué, affirmant que selon les photos à sa disposition elle pesait plusieurs centaines de kilos. M. Guthier a ajouté qu'il n'était pas certain que cette pluie soit tombée sur terre car malgré sa masse "elle a pu s'éteindre au dessus de la Terre".

Des centaines d'habitants du sud de la Bavière ont observé le phénomène et, inquiets, ont appelé les autorités locales tout au long de la nuit. Certains ont déclaré avoir entendu un bruit d'explosion après plusieurs éclairs dans le ciel.

"Des fenêtres ont même tremblé", a indiqué un porte-parole de la police locale.

Selon le ministère régional de l'Intérieur, jusqu'à 100.000 personnes auraient assisté à ces phénomènes lumineux. "Nous ne savons pas d'où ça vient", avait indiqué dimanche matin un porte-parole de la police."

Note d'Ufoweb, peut être un rapport avec cette nouvelle :

"Rentrée dans l'atmosphère d'un lanceur et de deux satellites

07/04 19:23 : L'étage supérieur d'une fusée Pegasus et les satellites américain HETE-1 et argentin SAC-B qui ne s'en étaient pas détachés lors du lancement en 1996 sont rentrés dans l'atmosphère dans la nuit de samedi à dimanche, a annoncé la NASA.

Les trois engins pesaient ensemble 535 kilos et la NASA prévoyait que seules quatre batteries en acier de 15 kilos au total résisteraient à l'entrée dans l'atmosphère.

Le lancement avait eu lieu le 4 novembre 1996. Le lanceur avait atteint la bonne altitude mais le troisième étage ne s'était pas séparé des deux satellites.

En Bavière, des centaines de personnes ont aperçu dans la nuit de samedi à dimanche de mystérieux phénomènes lumineux dans le ciel."

## Harro Zimmer on the Bavarian Fireball on Meteorobs

Hello Karl,

The event observed over on Saturday night was definitely not a decayer. The mentioned SAC-B/HETE/PEGASUS reentry occurred on April 07, 03:55 UTC +/-07 minutes (31.5°N, 92.4°E) over Tibet.

My own calculation agrees with this message from the US SPACECOM colleagues and shows

April 07, 03:51 UTC +/- 07 minutes (14.85°N, 72.92°E) also on northbound pass over the Arabian Sea.

BTW: The orbit of this decayer had an inclination of 37.9°, too much south to see this object during its last orbits from Southern Bavaria (Germany).

Harro Zimmer

Berlin.Germany

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## Website of Die Welt on the Bavarian Fireball

Meteorit verglüht über Bayern: Uni untersucht Gesteinsbrocken

München (dpa/lby) - Nach dem nächtlichen Meteoritenleuchten am Wochenende über Bayern untersuchen Geowissenschaftler der Ludwig-Maximilians-Universität (LMU) in München weitere Gesteinsbrocken auf ihre mögliche Herkunft aus dem All. «Es kommen immer mehr Leute, die anrufen und glauben, Stücke gefunden zu haben», sagte der Geowissenschaftler Prof. Klaus Weber-Diefenbach am Dienstag. Bei einem in Zolling (Landkreis Freising) entdeckten Brocken handelt es sich entgegen ersten Annahmen nicht um ein Gesteinsstück aus dem All.

12:14 am 09.04.2002 - Ressort: Bayern

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## Marco Langbroek on the Bavarian Fireball on Meteorobs

Hi Pavel, hi others,

Dieter Heinlein has sent me one of the all sky pictures of the s-Germany event at 20:20 UTC. Looks like a meteoric fireball indeed, not a decay. So what an extraordinary night then! 3 fireballs within a few hours!!

Pavel: I am extraordinarily busy here because I am in the last weeks of my PhD appointment and finishing my manuscript. But I'll see whether I can get the others in DMS to collect some systematic info on the second event at 0:28 UTC. I do not think it is likely that Dutch observations of the s-Germany event will



turn up (haven't seen a notice of such so far). Good luck with the work on the 20:28 bolide!

- Marco

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>From: Pavel Spurny
> >To: Marco Langbroek, meteorobs, meteorite-list@meteoritecentral.com
> >Cc: Alastair McBeath, Eddy Echternach, Ed Majden, Nick Martin, Benny Peiser
> >Date: Mon, 8 Apr 2002 23:27:46 +0200
> >Organization: AsU AV CR
>
> Hello Marco,
>
> exact time for the Western Austria/Southern Bavaria fireball is 20:20:17.8 UT
> on April 6. It is time for the brightest flare from two Czech radiometric
> units
> (DCF controlled).
>
> There are also several photographic records of this fireball from all-sky
> cameras located in Germany, Czech Republic and Austria. I have no information
> about other events.
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> In any case, this event was a really big fireball and not a satellite decay.
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> Best regards,
> Pavel
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## Pavel Spurny: The April 6, 2002 fireball

A very bright fireball illuminated large territory of Western Austria and Southern Bavaria on Saturday evening, April 6 at 22:20:18 local time (UT+2h). The fireball was observed by many casual witnesses over the territory of almost whole Central Europe, but most observations were reported from Bavaria and Western Austria. Except of numerous visual observations, the fireball was recorded by several kinds of scientific instruments. The most important records were obtained by the systematic long-term observational photographic program - the European Fireball Network (EN). The records were taken at 5 German, one Czech and one Austrian station of the EN. Each of these stations is equipped with one all-sky camera, which is open whole night and whole sky is photographed on one image. The German and Austrian stations are equipped with mirror all-sky cameras and are operated by the German Aerospace Center DLR, Berlin. The Czech stations of the EN are equipped with very precise Zeiss Distagon fish-eye objectives and are operated by the Astronomical Institute of the Academy of Sciences of the Czech Republic, Ondrejov. Most Czech stations had cloudy skies on April 6, however. The photographic records are most important for exact determination of the fireball atmospheric trajectory, including prediction of meteorite impact area and derivation of heliocentric orbit. In addition to these photographic data, the fireball was recorded by three radiometric systems placed in the Czech Republic at Ondrejov Observatory and Kunzak station, which gives us basic information about light curve and maximum brightness of the fireball and about exact time of the event. Furthermore the fireball was recorded by at least at two infrasound stations, one located at Freyung, Germany (see <http://www.seismologie.bgr.de>) and second at Deelen, The Netherlands (see <http://www.knmi.nl/~evers/infrasound/events/020406/bavaria-bolide.html>) and also at several seismic stations from Austria, Southern Germany and Switzerland.

All data presented below are based only on above-mentioned photographic and radiometric data recorded within the EN observing program and are very close to final values. All records were measured, reduced and all computations were performed at the Ondrejov Observatory, the headquarters of the European Fireball Network.

The fireball started its almost 92 km long luminous trajectory at an altitude of 85.6 km about 15 km NE from Innsbruck, Austria (longitude 11.564 deg E, latitude 47.304 deg N). Maximum brightness of about -18 absolute magnitude was reached in a bright flare at a height of 21 km near Garmisch-Partenkirchen, Germany (longitude 10.91 deg E, latitude 47.51 deg N). The fireball terminated at an altitude of only 15.8 km about 20 km W from Ga-Pa (longitude 10.85 deg E, latitude 47.53 deg N). Such deep penetration of a fireball is very scarce and this fireball belongs to the deepest ever-photographed fireballs in the history. It also implicates, that some part of the initial mass survived the ablation processes in the atmosphere and landed on the ground as meteorites. The slope of the atmospheric trajectory to the Earth's surface was 49.5 degrees. The fireball entered the atmosphere with the velocity of 20.9 km/s and during its flight substantially decelerated to the final value of only 4 km/s, when ablation process was stopped. According to the dynamic behavior in the atmosphere this fireball belongs to the fireball type I, which is usually identified with stony material, mostly ordinary chondrites. The initial dynamic mass of the entering meteoroid was about 500 kg and most of this mass was ablated and only about 30 kg of total mass could land on the ground in several fragments. The impact area is relatively large, it is at least several kilometers long and about 1km wide.

The main fragments will lie eastwards from Schwangau, Germany. Smaller fragments could be found also around the Austria-Germany border westwards from Ga-Pa. The whole area is located in high mountains (the Alps), which is unfortunately very unfavorable for any systematic search.

From the exact time of the fireball occurrence, its initial velocity, and the position of the radiant, we computed the heliocentric orbit. We found that the body, before its collision with Earth, orbited the Sun on an elliptic orbit defined by the following orbital elements: semimajor axis 2.4 AU, eccentricity 0.67, perihelion distance 0.79 AU, argument of perihelion 241.4 degrees, longitude of ascending node 16.8 degrees and inclination 11.4 degrees. Such kind of heliocentric orbit is quite usual for fireballs which penetrate very deep into the Earth's atmosphere and which can produce meteorites. The aphelion of these orbits lies in the main belt of Asteroids and therefore the asteroidal origin of these bodies is inferred. However, the heliocentric orbit of this fireball has one very significant exceptionality: we found that this orbit is the same as the orbit of the first photographed meteorite fall in the history - the Pribram meteorite fall on April 7, 1959. Both orbits are so close that there is no doubt that both bodies have the same origin. It is very important evidence for the existence of asteroidal streams and meteorite streams as suggested earlier by Halliday and others. From observations of both bolides we know that both bodies were far from each other in the orbit (probably about half of the period) when the Pribram collided with the Earth. It implies that many such bodies have to be on this orbit, because it is fantastic chance to photograph two meteorite falls from the same orbit on practically the same territory within only 43 years! It also substantiates why it is important to operate such long term observing program as the European Fireball Network is.

Finally, from the perfect similarity of both heliocentric orbits we can predicate, that both bodies had also the same composition and therefore we can expect that meteorites produced by the April 6 fireball are H5 ordinary chondrites.

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[DMS homepage](#)



[Hans Betlem and Casper ter Kuile](#)