

Date	Institute	Location
Turkey		
26 May 91	Istanbul University Observatory Research Center	Istanbul
Ukraine		
28 Feb 91	Main Astronomical Observatory, Ukrainian Academy of Sciences	Kiev Goloseevo
United Kingdom		
13 Nov 90	Armagh Observatory	Armagh
19 Aug 91	Leicester University X-ray Astronomy Group	Leicester
24 May 92	University College London/Optical Science Lab.	London
20 Oct 92	Department of Astronomy/University of Manchester	Manchester
United States		
02 Dec 90	Physics Dept., University of Wisconsin	Madison
19 Apr 91	NASA/IUE Observatory	Lanham
24 Apr 91	University of Wisconsin Astronomy Department	Seabrook Madison

Date	Institute	Location
20 Jun 91	Smithsonian Astrophysical Observatory	Cambridge
23 Jun 91	Space Telescope Science Institute	Baltimore
29 Sep 91	University of Wisconsin/Space Physics Dept.	Madison
03 Oct 91	NASA Goddard Space Flight Center	Greenbelt
03 Oct 91	Canada-France-Hawaii-Telescope Corp.	Hawaii
17 Nov 91	University of Colorado	Boulder
31 May 92	University of Maryland	College Park
29 Jul 92	Penn State University	University Park
06 Aug 92	Naval Research Laboratory/Space Science Division	Washington
10 Nov 92	Steward Observatory	Tucson
Uruguay		
31 Mar 92	Departamento de Astronomía/Facultad de Ciencias	Montevideo
Venezuela		
23 Oct 91	Centro de Investigaciones de Astronomía	Merida

The End of the Earth?

Titles play an important role in all areas of communication. A catching line on top of a long (and boring) text seduces the reader to have a closer look – you realize of course that that is exactly the reason why you are reading this! The boulevard press plays this game all the time, and most often you will find that the implied sensation isn't one, after all. But you spend your valuable time reading on to the end... hoping that something really interesting will show up further down the column.

Scary titles like the one above sell well nowadays. That is at least the impression we just had here at ESO, trying to answer a true deluge of questions about cosmic catastrophes. During the recent months, newspapers all over the world have been full of stories about "Lurking Danger from Space", "Giant Comet Will Collide with the Earth", "The World Ends in 2126", and the like. Solar-system astronomers from many countries have done their best to explain a frightened public about the real risks of cosmic collisions, why the dinosaurs were extinguished, how many Megatons the energy of a 1-km asteroid moving at 20 km/sec is equivalent to, how big the hole will be or what happens if it falls into the ocean, etc.

Much of this activity is the outcome of the recent announcement about the possibility that the Earth may be hit by comet P/Swift-Tuttle, which was finally recovered earlier this year after 130 years. This comet, which is named after

two American astronomers who discovered it in 1862, was already seen in Beijing in 1737, and possibly even much earlier in that same country. It seems to have a rather unpredictable motion because of irregular outgassing from the cometary nucleus which causes a variable, decelerating jet-effect. This is known as the "non-gravitational force", a phenomenon that has been known since the 1820's, when it was found impossible to explain the motion of comet P/Encke by the gravitational attraction from the Sun and the planets alone.

Extrapolating the motion of P/Swift-Tuttle forwards in time, it can be seen that it will take about another 134 years before it again comes close to the Earth. According to one particular orbital prediction, and further assuming that the comet for some reason will be about 14 days late, it can be shown that it will pass very close to the Earth on August 14, 2126; a further empirical fine-tuning of the predicted orbit will actually make it collide with the Earth. The very whisper about this possibility was of course more than enough to immediately alert the media; from a vague possibility with a lot of "if's", the unavoidable took its course and in many newspapers a disastrous collision soon became the firm reality. Most of the reports of course completely failed to mention the vanishing probability of such an event – if the comet would be just a few minutes too early or too late, it would pass by

without any damage, although it would still be a very spectacular sight in the sky.

Such encounters with long-period comets are much more rare than asteroid fly-bys. For instance, the one on December 8 by (4179) Toutatis was pretty close, at a distance of about 3.5 million kilometres only, and giving the astronomers a great opportunity to watch an asteroid from close quarters. Since asteroids are not plagued by non-gravitational forces (they supposedly have no ices which evaporate when they are near the sun), Toutatis' orbit can be calculated with great accuracy and there is no risk that it hits the Earth, at least this time. Still, there have been reports in the press that this will surely happen in a not too distant future.

As a solar-system astronomer, I must admit that I read such catastrophic reports with very mixed feelings. On the one hand, it gives you an impression of being a useful member of society when the media ask you to express your opinion about these events, and especially when you can put things right by referring to the extremely low probability of something disastrous happening. (You may sometimes have a brief thought about the precarious position of the astronomer-priests of earlier ages who were believed to be the masters of nature, at least until they made a wrong prediction).

On the other hand, I think that we astronomers must be extremely cau-

ESO, the European Southern Observatory, was created in 1962 to . . . establish and operate an astronomical observatory in the southern hemisphere, equipped with powerful instruments, with the aim of furthering and organizing collaboration in astronomy . . . It is supported by eight countries: Belgium, Denmark, France, Germany, Italy, the Netherlands, Sweden and Switzerland. It operates the La Silla observatory in the Atacama desert, 600 km north of Santiago de Chile, at 2,400 m altitude, where fourteen optical telescopes with diameters up to 3.6 m and a 15-m submillimetre radio telescope (SEST) are now in operation. The 3.5-m New Technology Telescope (NTT) became operational in 1990, and a giant telescope (VLT=Very Large Telescope), consisting of four 8-m telescopes (equivalent aperture = 16 m) is under construction. It will be erected on Paranal, a 2,600 m high mountain in northern Chile, approximately 130 km south of the city of Antofagasta. Eight hundred scientists make proposals each year for the use of the telescopes at La Silla. The ESO Headquarters are located in Garching, near Munich, Germany. It is the scientific-technical and administrative centre of ESO where technical development programmes are carried out to provide the La Silla observatory with the most advanced instruments. There are also extensive facilities which enable the scientists to analyze their data. In Europe ESO employs about 150 international Staff members, Fellows and Associates; at La Silla about 40 and, in addition, 150 local Staff members.

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tious when we deal with these matters. Even though cosmic collisions are bound to happen sooner or later, it would be very bad if we were ever suspected of deliberately creating a public scare by announcing a possible danger,

just to profit by the subsequent attention of the media. We are fortunate that astronomy is reasonably free from the problems that plague some of the much more "applied" sciences – let it continue to be so!
The Editor

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