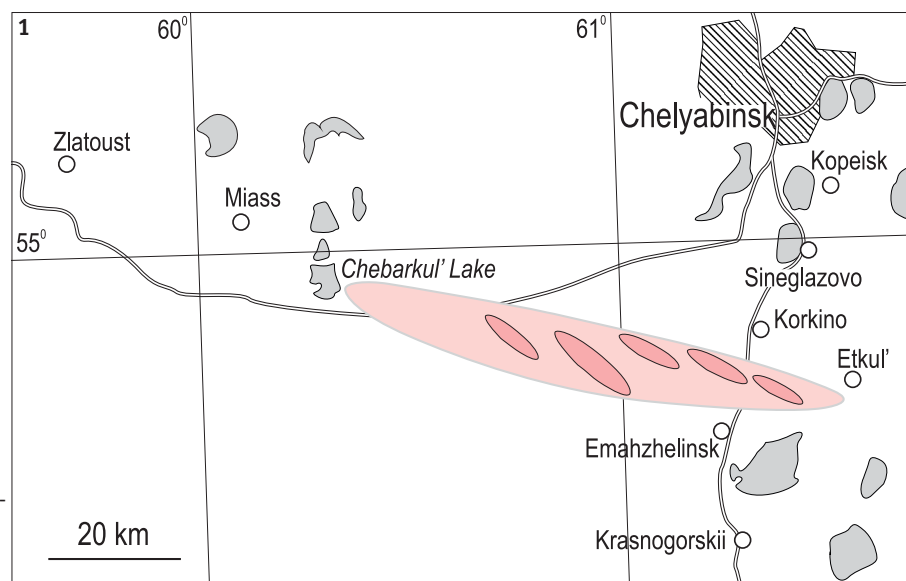


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The 15<sup>th</sup> of February, 2013, in the South Urals and in the whole world will go down in history of unique nature events. At 9:20 AM local time a large cosmic meteor body entered the Earth's atmosphere from southeast azimuth 285°. The meteorite body appeared at dawn, in a sky clear of clouds, in calm weather, as a dazzling bright white ball. At first it cut through the sky without a trace, and with the sunrise it appeared and split in two as a white trail of smoke with shimmering shades of black and light brown. There were sharp shadows on the ground moving along with the movement of the meteorite. For a while it looked like the flight of an aircraft. At one point, apparently reaching the dense layers of the atmosphere, the meteorite exploded, creating a huge smoky cloud over a kilometer long. Then the reduced body proceeded a long way across the sky, and went out with a smoky trail. The long extended blast site of the meteorite was painted in bright colors of burning flame, illuminating the white smoke. That part of the trace was abruptly enlarged in size. A powerful acoustic wave hit the ground surface in 2–2.5 minutes, first destroying structures, window frames, showcases and interiors of buildings in the city of Chelyabinsk and the nearby towns of Etkul, Emanzhelinsk, Pervomaisk. The first sound wave was followed by 10 other explosions that sounded like gun shots (*Figures 2, 3, 5*).

In the morning people who observed this phenomenon were shocked. Many attributed the scene to an airplane or rocket crash. Chelyabinsk, the victim of recent man-caused disasters, was shocked!



1. The territory scheme of the *Chelyabinsk* meteorite fall, February 15, 2013 – marked fall zones of meteor shower (light pink ellipse) emphasizing the site of intense shower of the meteoritic material (dark pink ellipses). Compiled by Sergey V. Kolisnichenko.

2. Part of the smoke trail from the fireball 'explosion'. The diameter of the cloud is about 1 km. Local time 9:22am. View from village Verkhnyaya Sanarka (azimuth of photography 300). Photo: S.V. Kolisnichenko.

3. Smoky double track of fireball. The view from the village Nadezhdinka, Kurgan region (shooting at the zenith). Photo: A. Abdullina.

4. Smoke trail of fireball. Local time 9:20 am. View from Verkhnyaya Sanarka (shooting azimuth 300). Photo: S.V. Kolisnichenko.



**Destruction.** According to the Chelyabinsk news agency “*Dostup*”, the acoustic wave of the fireball brought noticeable damage by breaking windows and damaging dilapidated buildings. The destruction by the acoustic wave from the space body entering into the dense layers of the atmosphere at supersonic speed was mainly felt in the Chelyabinsk, Emanzhelinsk, Etkul, Kopeysk, Korkino Chebarkul, Yuzhnouralsk, Zlatoust, Troitsk, Rose, Uvelsky and Krasnoarmeyskaya areas. As a result of the fall more than one and a half thousand people were injured, glass was knocked out of thousands of home by the shock wave. It was estimated by the regional administration that the damage was approximately a billion rubles (*Figure 6*).

When everything got quiet, people came and began to look around and discuss what had happened. There were smoky double loops in the sky. Frames of thousands of apartments, large showcases of major stores and schools all lost window glasses in seconds. There were many wounded. The shock wave destroyed part of a warehouse of a zinc plant in Chelyabinsk which exploded. As a result of heavy congestion, the cellular telephony failed.

Destructions varied. On the multi-story building in the windows of the big stores we saw a selective action of the acoustic wave. In some cases, the windows of the first floor were completely shattered, but the second floor windows were left undamaged.

Windows of the same kind were blown in different ways. At some places, while the window frames and glass were undamaged, the doors flew out and glass lampshades were shattered.

