

<p>When worlds collide, the result is spectacular, and astronomers think they've detected the aftermath of such an event around another star.</p>	<p><i>PR animation</i></p>
<p>[Titles]</p>	<p><i>Opening titles</i></p>
<p>Nearly 60 years ago, audiences thrilled to the destruction of the Earth in George Pal's classic film, "When Worlds Collide." The idea of a planetary smash-up is a staple of science fiction, but can it really happen?</p>	<p><i>[host]</i> <i>Movie Poster</i></p>
<p>Astronomers using NASA's Spitzer Space Telescope think they've actually seen the aftermath of such a collision around another star. It can even help us understand similar calamities that happened long ago in our own solar system.</p>	<p><i>[host]</i></p>
<p>The story unfolded as Dr. Casey Lisse and his team studied disks around young stars. Once planets have formed astronomers think there are a lot of left-over asteroids in the system. They occasionally slam together and produce dusty debris.</p>	<p><i>Animation of debris disk with collisions</i></p>
<p>Spitzer's Infrared Spectrograph was designed to detect the faint glow from this material. By spreading the light out into its component colors, astronomers can look for the spectral fingerprints of different minerals. This way we can figure out the composition of disks around other stars.</p>	<p><i>[host]</i></p>

<p>Our dusty star of interest is a faint speck known as HD 172555. It's about 100 light years away and 12 million years old which, compared to our 4.5 billion year old Sun, is like a baby born a few days ago.</p>	<p><i>[host]</i> <i>Celestia fly-up to star</i></p>
<p>Studying its spectrum, Dr. Lisse and his colleagues realized they had found something very peculiar that they had not seen around other stars. Aside from the usual indicators of rocky rubble, they found features corresponding to tektite, obsidian, and silicon monoxide gas.</p>	<p><i>[host]</i> <i>spectrum side graphic highlighting materials</i></p>
<p>What's strange is that tektite and obsidian are formed from molten materials. Tektites are hardened chunks of lava found around meteor impacts on Earth, and obsidian is volcanic glass. Vaporized rocks can form silicon monoxide gas.</p>	<p><i>Photomontage of tektite &amp; obsidian stills</i></p>
<p>You don't get this kind of material by just smashing a couple of asteroids together. The evidence suggests something much more... cataclysmic. Imagine what would happen if our moon slammed, at high velocity, into a Mercury-sized planet. The resulting impact would eject a massive amount of molten material into space. As it cooled it would likely form tektite, obsidian, and silicon monoxide gas, explaining the features seen in the HD 172555 spectrum.</p>	<p><i>Press release smash-up animation</i></p>
<p>It's amazing to think Spitzer may have caught the aftermath of such an incredible collision. But, it's not the first time astronomers have speculated about world-shattering events. Things like this may have happened right here in our own back yard.</p>	<p><i>[host]</i> <i>zoom in to solar system</i></p>

<p>Mercury is a strangely dense planet compared to the other rocky worlds in our solar system. If it formed from the same stuff as Venus and Earth, why would it be different? A world-shattering impact could be the answer. When planets form the lighter materials rise and denser ones sink to the core. Remove the outer, lighter layer, and you're left with a denser planet, once what's left cools off.</p>	<p><i>Animation of Mercury orbiting the sun</i></p> <p><i>Cut to animated diagram showing density within a planet</i></p>
<p>Looking to our neighbor Mars we see a massive impact scar in its Southern hemisphere. This area, known as the Hellas Basin, must have formed from an asteroid impact long ago. The resulting plume of molten material would have been blasted into space, some of it eventually reaching the ancient Earth.</p>	<p><i>Animation of Mars pushing into the Hellas Basin region</i></p>
<p>Even closer to home, most astronomers believe that our own moon was the result of a similar cataclysm. The theory is that a Mars-sized body grazed the still-forming Earth, generating a massive amount of molten debris. The orbiting rubble would have clumped together over time, forming the moon.</p>	<p><i>[host]</i></p> <p><i>Cosmic Collisions excerpt</i></p>
<p>The tektite and obsidian debris from such massive impacts would not last long in our solar system, or others. Solar winds and gravitational interactions tend to sweep away the dust over time, and in a few tens of thousands of years the evidence would be erased.</p>	<p><i>Animation of clearing out disk</i></p>

<p>In the long history of our solar system, that's hardly an eyeblink. The evidence may be long gone here, but seeing what may happen when worlds collide around a nearby star shows us it's not just science fiction after all.</p>	<p><i>[host]</i> <i>side graphic of PR animation</i></p>
<p>For the Spitzer Science Center I'm Dr. Robert Hurt, reminding you that there's a hidden universe just waiting to be discovered.</p>	<p><i>[host]</i></p>