

## **Non-euclidean Virtual Reality**

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The properties of euclidean space seem natural and obvious to us, to the point that it took mathematicians over two thousand years to see an alternative to Euclid's parallel postulate. The eventual discovery of hyperbolic geometry in the 19th century shook our assumptions, revealing just how strongly our native experience of the world blinded us from consistent alternatives, even in a field that many see as purely theoretical. Non-euclidean spaces are still seen as unintuitive and exotic, but with direct immersive experiences we can get a better intuitive feel for them. The latest wave of virtual reality hardware, in particular the HTC Vive, tracks both the orientation and the position of the headset within a room-sized volume, allowing for such an experience. We use this nascent technology to explore the three-dimensional geometries of the Thurston/Perelman geometrization theorem. This talk focuses on our simulations of  $H^3$  and  $H^2 \times E$ .