On caustics, waves reach their greatest intensity. At the opposite extreme - and indeed complementary to caustics - are places where the wave intensity is zero. These are points in the plane, or lines in three dimensions. They are singularities of the phase of the wave, where the phase takes all values. Since phase is a periodic variable (0 and $2\pi$ are equivalent), it is natural to represent it by colour, with hues progressing from red through yellow green, blue and purple back to red:

Here is a plane wave with a phase singularity; the resemblance to a crystal with an extra half-plane of atoms has led to phase singularities being called wavefront dislocations; the analogy is far-reaching:

Phase singularities were discovered by William Whewell in 1833, in the wavefronts of the tides. These are the 'co-tidal lines' linking places where the tide is high at a given time. Dislocations are 'amphidromies', around which the wavefronts rotate like the spokes of a wheel. Here is an amphidromy in the North Sea:

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