Symmetry structure of starbursts

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When looking at a star under low-light conditions, most people perceive some structured symmetric patterns, which have been called starbursts. Starburst patterns can be very diverse but some typical ones are those in which a bright central area is surrounded by clearly marked intensity spikes (star points) [2, 3]. These light patterns are formed due to the imperfections in the optical elements of the human eye, which are mathematically described by a bivariate orthogonal Zernike expansion. Based on the deep relation between wavefront aberration and caustic patterns symmetry-preserving and the properties of some singular points of curvature functions of the classical Zernike polynomials [1], in this work we investigate a theoretical explanation of the types of symmetries and the number of points of starbursts.

References

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