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Light can be fractal!

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Fractal is a mathematical series that manifests replicated patterns at every scale. If the repeated patterns are identical in each scale, the fractal in this case is called a self-similar fractal. That type of fractal is described by a mathematical equation which is nowhere differentiable. Fractals have found their way in applications such as fractal antennas and transistors, digital imaging as well as fractal cosmology science.

Theoretical simulations show that unstable laser resonators contain a special plane, self-conjugate plane, in which the eigenmodes not only have the same pattern but the eigenmodes are magnified copies of themselves. Here, we introduce a new design for laser resonator that are capable of generating eigenmodes with self-similar fractal features. The fractal feature is proved by finding a typical image of the eigenstate at different scales as well as by calculating the fractal dimensions of the eigenstates.

Apply to be
 considered for a student
   award (Yes / No)?

yes

Level for award
 (Hons, MSc,
   PhD, N/A)?

phd

Main supervisor (name and email)
and his / her institution

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Would you like to
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no

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