



## The Penrose Transform: Its Interaction with Representation Theory (Dover Books on Mathematics)

By Robert J. Baston, Michael G. Eastwood

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In recent decades twistor theory has become an important focus for students of mathematical physics. Central to twistor theory is the geometrical transform known as the Penrose transform, named for its groundbreaking developer. Geared toward students of physics and mathematics, this advanced text explores the Penrose transform and presupposes no background in twistor theory and a minimal familiarity with representation theory.

An introductory chapter sketches the development of the Penrose transform, followed by reviews of Lie algebras and flag manifolds, representation theory and homogeneous vector bundles, and the Weyl group and the Bott-Borel-Weil theorem. Succeeding chapters explore the Penrose transform in terms of the Bernstein-Gelfand-Gelfand resolution, followed by worked examples, constructions of unitary representations, and module structures on cohomology. The treatment concludes with a review of constructions and suggests further avenues for research.

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## **Editorial Review**

### Review

"Roger Penrose is the developer of twistor theory, a geometrical study of conformally invariant physics in four spacetime dimensions. The work is an addition to the growing body of contemporary research in the area. For research collections in mathematics and mathematical collections." *New Technical Books, NY Public Library*

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### About the Author

Robert J. Baston was on the faculty of The Mathematical Institute, University of Oxford.

Michael G. Eastwood is Professor of Mathematics at the Mathematical Sciences Institute, Australian National University, Canberra.

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