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On duality in $\mathcal{N} = 2$ supersymmetric Liouville theory. (English) [Zbl 1477.81042]

Summary: Similarly to the bosonic Liouville theory, the $\mathcal{N} = 2$ supersymmetric Liouville theory was conjectured to be equipped with the duality that exchanges the superpotential and the Kähler potential. The conjectured duality, however, seems to suffer from a mismatch of the preserved symmetries. More than fifteen years ago, when I was a student, my supervisor Tohru Eguchi gave a beautiful resolution of the puzzle when the supersymmetry is enhanced to $\mathcal{N} = 4$ based on his insight into the underlying geometric structure of the $A_1$ singularity. I will review his unpublished but insightful idea and present our attempts to extend it to more general cases.

MSC:

81Q60 Supersymmetry and quantum mechanics
81V73 Bosonic systems in quantum theory
35B53 Liouville theorems and Phragmén-Lindelöf theorems in context of PDEs
08C20 Natural dualities for classes of algebras

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