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Bernstein-Gelfand-Gelfand reciprocity property and categorification of the polynomial ring. Preliminary report.

We develop a diagrammatic categorification of the polynomial ring $\mathbb{Z}[x]$, based on the geometrically defined graded algebra. This construction generalizes to categorification of some special functions, such as Chebyshev polynomials. Diagrammatic algebras featured in these categorifications lead to the first topological interpretations of the Bernstein-Gelfand-Gelfand reciprocity property. (Received September 18, 2015)