Webs, Foams, Knot Invariants, and Representation Theory

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We will discuss webs, certain trivalent graphs that give a 2d diagrammatic description of certain polynomial knot invariants, and foams, their "categorified" analogues which give 3d diagrammatics for knot homologies (more-sophisticated knot invariants). We will then see how these structures encode interesting representation-theoretic information, and will touch on examples that show how the diagrammatic descriptions of these structures reveal interesting algebraic properties of the corresponding knot invariants.