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**Christian K Zickert\*** ([zickert@math.umd.edu](mailto:zickert@math.umd.edu)), 10101 Baltimore Ave 1307, 10101 Baltimore Ave 1307, College Park, MD 20740. *Thurston's gluing equations for  $PGL(n, C)$ .*

Thurston's gluing equations are polynomial equations invented by Thurston to explicitly compute hyperbolic structures or, more generally, representations in  $PGL(2, C)$ . This is done via so called shape coordinates. We generalize the shape coordinates to obtain a parametrization of representations in  $PGL(n, C)$ . We give applications to quantum topology, and discuss an intriguing duality between the shape coordinates and the Ptolemy coordinates of Garoufalidis-Thurston-Zickert. The shape coordinates and Ptolemy coordinates can be viewed as 3-dimensional analogues of the X- and A-coordinates on higher Teichmuller spaces due to Fock and Goncharov. (Received February 13, 2013)