1176-41-14   **Ahmad Barhoumi*** (`barhoumi@umich.edu`), 530 Church Street, 1846 East Hall, Ann Arbor, MI 48108-2428, **Pavel Bleher** (`pbleher@iupui.edu`), 402 N. Blackford Street, LD 224M, Indianapolis, IN 46202, and **Alfredo Deano** and **Maxim Yattselev** (`maxyatts@iupui.edu`), 402 N. Blackford Street, LD 270C, Indianapolis, IN 46202. *Orthogonal polynomials with respect to varying exponential weights.* Preliminary report.

Initially used to prove universality results in matrix models, orthogonal polynomials with varying exponential weights have since accumulated an impressive list of applications in approximation theory and mathematical physics. This is made possible thanks to the development of the Riemann-Hilbert problem (RHP) for orthogonal polynomials. While the RHP is insensitive to the weight being complex-valued, many of the familiar properties of the polynomials (even their existence!) is no longer guaranteed.

In this talk, I will highlight some of the challenges that arise in analyzing orthogonal polynomials with a complex-valued weight, while using the case of cubic polynomial potential to illustrate how these problems arise. (Received December 20, 2021)