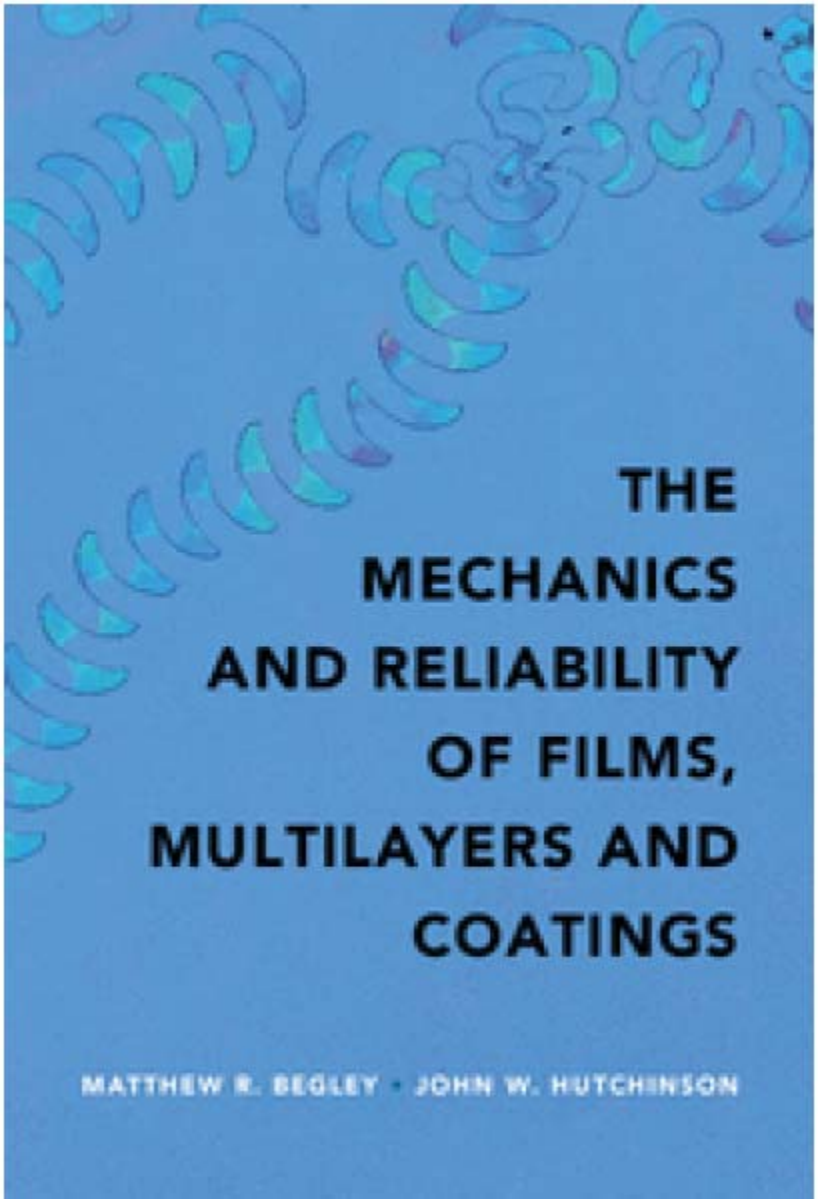

The Mechanics and Reliability of Films, Multilayers and Coatings

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A wide variety of applications ranging from microelectronics to turbines for propulsion and power generation rely on films, coatings and multilayers to improve performance. As such, the ability to predict coating failure – such as delamination (debonding), mud-cracking, blistering, crack kinking and the like – is critical to component design and development. This work compiles and organizes decades of research that established the theoretical foundation for predicting such failure mechanisms and clearly outlines the methodology needed to predict performance. Detailed coverage of cracking in multilayers is provided with an emphasis on the role of differences in thermoelastic properties between the layers. The comprehensive theoretical foundation of the book is complemented by easy-to-use analysis codes designed to empower novices with the tools needed to simulate cracking; these codes enable not only precise quantitative reproduction of results presented graphically in the literature, but also the generation of new results for more complex multilayered systems.

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