1050-30-128 **Tadeusz Iwaniec**, **Leonid V Kovalev** and **Jani Onninen*** (jkonnine@syr.edu), Department of Mathematics, Syracuse University, 215 Carnegie Building, Syracuse, NY 13244. *Harmonic mappings between doubly connected domains.* Preliminary report.

By the Riemann Mapping Theorem, simply connected domains are conformally equivalent. Annuli are the first place one meets obstructions to the existence of conformal mappings. The famous theorem, due to Schottky (1877), tells us that an annulus $\mathbb{A} = A(r, R)$ can be mapped conformally onto the annulus $\mathbb{A}^* = A(r_*, R_*)$ if and only if $R/r = R_*/r_*$. In this talk we discuss the 1962 conjecture of Nitsche which asserts that a harmonic homeomorphism $h\colon \mathbb{A} \to \mathbb{A}^*$ exists only if

$$\frac{R_*}{r_*} \geq \frac{1}{2}\left(\frac{R}{r} + \frac{r}{R}\right).$$

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