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**Modelling Shapes of the Mitochondrial Crista Membrane** JIM NULTON, PETER SALAMON, JOE MAHAFFY, (Mathematics), TERRY FREY, (Biology), ARUN KUMAR, ARLETTE BALJON, (Physics), San Diego State University, CA — Recently, electron tomographs have revealed a novel structure of the inner mitochondrial membrane. They show that the crista membrane contains both tubules and lamellae. The structural organization of mitochondria affects their functionality, for instance it may be important in explaining their role in programmed cell death. A model will be presented to account thermodynamically for the observed uniform radii of the tubules. The model contains two differently shaped lipids, which are allowed to redistribute between the two sides of the membrane. It makes two predictions: (1) there is an osmotic pressure difference of 0.2 atmospheres across the inner membrane as a consequence of the experimentally observed tubular radii of 10 nm; (2) migration of differently shaped lipids causes concentration variations between the two sides of the tubular membrane on the order of 7 percent.

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