

## Analysis and Applied Mathematics Seminar

*Some projects related to developable surfaces: closed ribbons, generating surfaces, and a bonus*

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**Abstract:** In this talk I will mainly discuss two projects related to developable surfaces. The first deals with deforming an unstretchable material surface to form a closed ribbon. The bending energy associated with such a deformation is proportional to the integral of the square of the mean curvature over the deformed surface. However, since the material is unstretchable, this energy can be dimensionally reduced. While this has been recognized in earlier works, I'll fill in the gaps and present the complete variational problem. The next project, which was inspired by the first, answers the question of how can you construct a developable surface from a space curve. It turns out that besides the well-known tangent and rectifying developable surfaces, there is an entire family of such surfaces that can be generated. The last few minutes of my talk will be dedicated to my current work on extending the dimensional reduction argument of the first part of my talk to more general domains.

Monday, February 28 at 4:00 PM in 636 SEO