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**MATHEMATICAL MOMENTS**



**NEW!**

# Keeping the Roof On



It's impossible to prevent all the damage caused by a hurricane's wind, rain, and storm surge, but a new idea based on math may prevent some of the wind damage done to homes. Ingeniously designed sheets connected to a roof and anchored to the ground before a storm allow some of a severe storm's wind to pass through and redirect the force so that it pushes down on the roof and counterbalances the forces pushing up. The greater the wind, the greater the downward force. The sheets were created using clever engineering combined with mathematical models built on differential equations, vector analysis, and trigonometry. In a test of prototypes during a hurricane with 110 mph winds, the roof where the sheets were installed held firm while houses next door lost portions of their roofs or entire additions.



Stefan Siegmund  
TU Dresden  
Photo: © N. Eisfeld.

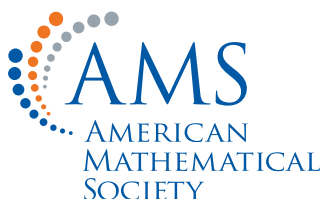


Main image: Hurricane Harvey damage, © William Luther/San Antonio Express-News via ZUMA Wire.  
Inset: Illustration of home with wind-protection membranes, S. Siegmund & M. Eggers.

Listen Up!



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The **Mathematical Moments** program promotes appreciation and understanding of the role mathematics plays in science, nature, technology, and human culture.

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