

# Xingjian Zhou

## Curriculum Vitae

### Personal Information

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**Address:** School of Mathematical Sciences, Xiamen University  
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### Education

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#### Ph.D. student

2022-present  
Advisor: Chao Xia  
Xiamen University  
School of Mathematical Sciences

#### M.S. (promote to Ph.D.)

2020-2022  
Advisor: Chao Xia  
Xiamen University  
School of Mathematical Sciences

#### B.S.

2016-2020  
Southeast University  
School of Mathematics

### Graduate Courses

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Differential Manifold, Riemannian Geometry, Algebraic Topology, Second Order of Elliptic Differential Equations, Geometric Analysis, Minimal Surfaces.

### Research Interest

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**Key words:** Geometric Analysis, Mathematical Physics, Minimal surfaces, CMC surfaces, Geometric inequalities, General Relativity.

**Mass:** The mass of manifolds, closely related to scalar curvature, is a geometric quantity with many beautiful results, such as the positive mass theorem, Penrose inequality, and mass-capacity inequality. Estimate other geometric quantities by using mass is a very interesting topic.

**Stable Minimal Surfaces:** The study of minimal surfaces has a rich history and continues to present numerous unsolved problems. The Bernstein problem stands out as particularly renowned. Recently, Chodosh, Li, Minter, and Stryker provided a proof that complete, two-sided, stable minimal surfaces in  $\mathbb{R}^5$  is hyperplane (source). They had previously established this result in the four-dimensional case. This naturally raises the question: what about  $\mathbb{R}^6$  and  $\mathbb{R}^7$ ?

To deal with these problems, various techniques are employed, such as constructing monotonic quantities via flows and using  $\mu$ -bubble methods. The difficulties of both approaches lies in controlling the Ricci curvature in the normal direction. I am particularly interested in these methods.

### Publication

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Chao Xia, Jiabin Yin, Xingjian Zhou, New monotonicity for p-capacitary functions in 3-manifolds with nonnegative scalar curvature, Adv. Math. 440 (2024) Article Number: 109526.