**2020-2021第一学期几何讨论班**

时间：2020.9. 主讲人：王丽莉 地点：理工南楼616

题目：On the fundamental gap of spheres

摘要：

时间：2020.9. 主讲人：林和子 地点：理工南楼616

题目：Gradient estimate and Liouville theorems for p-harmonic maps

摘要：

时间：2020.10.21 主讲人：王孝振 地点：理工南楼616

题目：Moebius geometry of submanifolds in S^n

摘要：In this paper we define a Moebius invariant metric and a Moebius invariant second fundamental form for submanifolds in S^n and show that in case of a hypersurface with n ≥ 4 they determine the hypersurface up to Moebius transformations. Using these Moebius invariants we calculate the ﬁrst variation of the moebius volume functional. We show that any minimal surface in S^n is also Moebius minimal and that the image in S^n of any minimal surface in R^n unter the inverse of a stereographic projection is also Moebius minimal. Finally we use the relations between Moebius invariants to classify all surfaces in S^3 with vanishing Moebius form.

时间：2020.10.28 主讲人：王孝振 地点：理工南楼616

题目：Moebius geometry of submanifolds in S^n-2

摘要：In this paper we define a Moebius invariant metric and a Moebius invariant second fundamental form for submanifolds in S^n and show that in case of a hypersurface with n ≥ 4 they determine the hypersurface up to Moebius transformations. Using these Moebius invariants we calculate the ﬁrst variation of the moebius volume functional. We show that any minimal surface in S^n is also Moebius minimal and that the image in S^n of any minimal surface in R^n unter the inverse of a stereographic projection is also Moebius minimal. Finally we use the relations between Moebius invariants to classify all surfaces in S^3 with vanishing Moebius form.

时间：2020.11.4 主讲人：林丽妙 地点：理工南楼616

题目：A Moebius rigidity of compact Willmore hypersurfaces in S^{n+1}

摘要：Let x : M^n → S^n+1 be an immersed hypersurface without umbilical point, then one can define the Möbius metric g, the Möbius second fundamental form B and the Blaschke tensor A on the hypersurface M^n which are invariant under the Möbius transformation group of S^n+1. A hypersurface is called a Willmore hypersurface if it is the critical point of the volume functional of Mn with respect to the Möbius metric g. In this paper, we prove that if the hypersurface x is a compact Willmore hypersurface without umbilical point, then

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the equality holds if and only if the hypersurface Mn is Möbius equivalent to one of the Willmore tori



where the tensor  .

时间：2020.11.11 主讲人：林丽妙 地点：理工南楼616

题目：A Moebius rigidity of compact Willmore hypersurfaces in S^{n+1}

摘要：Let x : M^n → S^n+1 be an immersed hypersurface without umbilical point, then one can define the Möbius metric g, the Möbius second fundamental form B and the Blaschke tensor A on the hypersurface M^n which are invariant under the Möbius transformation group of S^n+1. A hypersurface is called a Willmore hypersurface if it is the critical point of the volume functional of Mn with respect to the Möbius metric g. In this paper, we prove that if the hypersurface x is a compact Willmore hypersurface without umbilical point, then

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the equality holds if and only if the hypersurface Mn is Möbius equivalent to one of the Willmore tori



where the tensor  .

时间：2020. 11.18 主讲人：王鹏 地点：理工南楼616

题目：On Simons inequality and its applications.

摘要：

时间：2020. 12.2 主讲人：林和子 地点：理工南楼616

题目：The Isoperimetric Inequality for a Minimal Submanifold in Euclidean Space.

摘要：We prove an isoperimetric inequality which holds for minimal submanifolds in Euclidean space of arbitrary dimension and codimension. Our estimate is sharp if the codimension is at most 2.

时间：2020. 12.9 主讲人：王丽莉 地点：理工南楼616

题目：An Estimate of the Gap of the First Two Eigenvalues in the Schrodinger Operator.

摘要：

时间：2020. 12.23 主讲人：王丽莉 地点：理工南楼616

题目：Estimates on the modulus of expansion for vector fields solving nonlinear equations.

摘要：In this article, by extending the method of Andrews and Clutterbuck (2011) [2] we prove a sharp estimate on the expansion modulus of the gradient of the logarithm of the parabolic kernel to the Schrödinger operator with convex potential on a bounded convex domain. The result improves an earlier work of Brascamp–Lieb which asserts the log-concavity of the parabolic kernel. We also give an alternate proof to a corresponding estimate on the first eigenfunction of the Schrödinger operator, obtained firstly by Andrews and Clutterbuck via the study of the asymptotics to a parabolic problem. Our proof is more direct via an elliptic maximum principle. An alternate proof of the fundamental gap theorem of Andrews and Clutterbuck (2011) [2], by considering the quotient of moduli of continuity, is also obtained. Moreover we derive a Neumann eigenvalue comparison result and some other lower estimates on the first Neumann eigenvalue for Laplace operator with a drifting term, including an explicit estimate on a conjecture of P. Li.

时间：2020. 12.30 主讲人：王鹏 地点：理工南楼616

题目：Willmore Stability of the Lawson minimal surfaces $\xi\_{g,1}$.

摘要：The generalized Willmore conjecture, proposed by Rob Kusner,  states that the Lawson minimal surface $\xi\_{g,1}$ minimizes Willmore energy among all closed surfaces of genus $g>1$.  So far there are very few progress on this conjecture. A natural idea is to consider the Willmore stability of them. In this talk we will show that they are strictly Willmore stable both in $S^3$ and in $S^n$ via $S^3\subset S^n$, based on a joint with Prof. Kusner.