On knot surgery 4-manifolds

Jongil Park

February 18–19, 2014

Department of Mathematical Sciences, Seoul National University,
Seoul, Korea
E-mail:**jipark@snu.ac.kr**

Abstract

Since the inception of gauge theory, in particular Seiberg-Witten theory, topologists and geometers working on 4-manifolds have developed various techniques and they have obtained many fruitful and remarkable results on 4-manifolds in last 30 years. Among them, a knot-surgery technique introduced by R. Fintushel and R. Stern turned out to be one of most effective techniques to modify smooth structures without changing the topological type of a given 4-manifold. Nevertheless, there are still fundamental problems on knot surgery 4-manifolds to be settled down. For example, it is an intriguing question to know whether a knot surgery 4-manifold determines a prime knot up to mirror, called Fintushel-Stern conjecture on knot surgery 4-manifold.

In this talk first I'd like to review a knot-surgery technique in some details. And then I'll show how to use it for constructing a family of non-simply connected, non-diffeomorphic symplectic 4-manifolds which share the same Seiberg-Witten invariants. Furthermore, if a time is allowed, I'll also investigate some open problems such as Fintushel-Stern conjecture.