Let $K = \mathbb{Q}(\sqrt{d})$ with $d < 0$ and squarefree. Let $C(K)$ be its corresponding class group. It is known via the Artin map that there is a maximal unramified abelian extension $H$ (called the Hilbert class field of $K$) with the property that the galois group $\text{Gal}(H|K)$ is isomorphic to $C(K)$. It is well known that the modular $j$-invariant evaluated at $w$ where $w = d^{(1/2)}$ or $(3 + d^{(1/2)})/2$ can be used to generate $H$ over $K$. Besides these values, there are other special values of modular functions (for example, the Weber functions) that serve the same purpose. We define a class invariant to be a special value of modular function (not necessarily $j$-invariant) that generates $H$ over $K$.

In this talk, we will discuss some properties and applications of these class invariants.

**Speaker Biography**

Chan Heng Huat received his Ph.D. at the University of Illinois at Urbana-Champaign in 1995 under the supervision of Professor B. C. Berndt and spent nine months at the Institute for Advanced Study after his graduation. He then took up a one-year visiting position at the National Chung Cheng University in Taiwan. In 1997, he returned to Singapore to join the Department of Mathematics at the National University of Singapore. He received the Young Scientist Award in 1999 and the Singapore Youth Award in 2003. He was also a Commonwealth Fellow in 2000 and Hitachi Fellow in 2008. His main research area is in understanding identities found in Ramanujan's notebooks and relating these identities to modern number theory.

When he is not working on mathematical problems, he enjoys spending his time with his wife and three kids, aged 15, 13, and 7.