1135-35-1062 **Kim B. Hoewoon*** (kimho@math.oregonstate.edu), Department of Mathematics, Oregon State Unive, Corvallis, OR 97331. *Fourier Transforms and Generalized Hyers-Ulam Stability of Laplace Equations in a Half Space.*

In 1940, a Polish-American mathematician, S. M. Ulam proposed the stability problem of the linear functional equation $f(x+y) = f(x) + f(y)$ that can be generalized as "Under what conditions a mathematical object satisfying a certain property approximately must be close to an object satisfying the property exactly?". For the last decades, stability problems of various functional equations, not only linear case, have been extensively investigated and generalized by many mathematicians. An extension of the Ulam's stability problems in terms of differential equations was recently proposed: the differential equation $\phi(f, y, y', \cdots, y^{(n)}) = 0$ has Hyers-Ulam stability provided for given $\epsilon > 0$ and a function y satisfying $|\phi(f, y, y', \cdots, y^{(n)})| \leq \epsilon$, there exists the solution y_0 to the differential equation such that $|y(x) - y_0(x)| \leq K(\epsilon)$ and $\lim_{\epsilon \to 0} K(\epsilon) = 0$. In this presentation, we will talk about the generalized Hyers-Ulam stability of the Laplace equation $\triangle u = 0$ in a half space in terms of Fourier transforms as an open and accessible problem for undergraduate research. (Received September 19, 2017)