

## Leave Request for AY 2010-2011: Frank Thorne

I am writing to request continued unpaid leave from USC for the academic year 2010-2011. I was hired in 2008, shortly after I accepted a three-year NSF Postdoctoral Fellowship at Stanford. Currently I am in the second year of this fellowship, and I hope to remain at Stanford for the third and final year of my fellowship. I am grateful to have the support of the Department of Mathematics in this regard, and would be very grateful to have the University's permission as well.

I am currently enjoying tremendous scientific opportunities at Stanford. I have been actively working with Professors Kannan Soundararajan and Akshay Venkatesh, two of the world's leading experts in my field. Last spring, at Venkatesh's suggestion, I began studying the theory of Shintani zeta functions. These interesting functions form a bridge between algebraic and analytic number theory, two sides of my subject which are too often studied separately. On the algebraic side, Shintani zeta functions tie into the recent theory of "higher composition laws", which are a direct and startling generalization of classical work of Gauss. On the analytic side, they almost fit into the classical theory of zeta functions, with a couple of interesting exceptions. These exceptions, in turn, may have interesting consequences for the algebraic theory, and investigating these consequences is one active goal of my research.

This research complements my 2008 graduate thesis, which was written in a related but distinct area of analytic number theory. Stanford has been an ideal location to further develop the theory of Shintani zeta functions, because Venkatesh is an expert in the related algebraic theory, and Soundararajan is an expert in the analytic theory. In addition, Stanford is home to a number of outstanding graduate students and postdocs who are interested in similar topics.

My leave from USC (along with my NSF fellowship, which provides for full support with minimal teaching duties) has offered me a great deal of flexibility in traveling and making connections all around the world. This past January, I was invited to make an extended trip to Japan, where I spoke at three universities and met colleagues whose ongoing research complements my own. (At least one of them hopes to visit me at South Carolina.) I also travelled to Korea and to Princeton and had productive mathematical conversations there as well. In addition, I travelled to South Carolina last December to touch base with my colleagues. I especially enjoyed the chance to speak with several USC graduate students who are pursuing topics related to my research interests.

My fellowship at Stanford is scheduled to end in 2011, and although I am asking to be allowed to take full advantage of my fellowship, I am genuinely looking forward to coming to South Carolina. At Stanford I have the opportunity to learn from world-class experts, essentially in the role of an advanced student. At South Carolina the focus will shift to my ability to actively contribute to USC's teaching and research missions. Accordingly, I look forward to arriving as prepared as possible.

I am very grateful that USC has allowed me two years of unpaid leave, and I humbly ask for a third and final year. My NSF fellowship and my appointment at Stanford have allowed me to branch out and increase the scope of my research interests, while making connections to scholars all over the world. A third year of leave would allow me to continue to develop these interests and connections, and further prepare me to meet the high expectations that the University and the Department of Mathematics have for me.

Again, thank you very much.