June 18, 2009

Letter for Celso Doria

I am writing concerning the visit of Professor Celso Doria of the University of Florianopolis to the Department of Mathematics of Michigan State University during 2008 and 2009. Professor Doria was an active participant in our program in many ways. He attended many of our seminars and gave very interesting and useful talks. Furthermore, he was very accessible for mathematical discussions with faculty, postdocs and graduate students. In particular, during this time, I taught an advanced course on Monopole Floer Homology, and Professor Doria was a great help in working out and understanding analytical aspects of the Kronheimer-Mrowka program. Everyone who attended my lectures was happy the Professor Doria was there to help.

Professor Doria used his time at Michigan State to learn and work on Heegaard-Floer and Monopole-Floer homology theories. These are very recent developments in topology and geometric analysis. I had many discussions with Professor Doria on these topics, and I am happy to report that he has developed a novel, and potentially extremely useful, point of view.

The Ozsvath-Szabo Heegaard-Floer homology theory is a kind of Lagrangian Floer homology of a symmetric power of the Riemann surface giving a Heegaard splitting of a 3-manifold. The thrust of Professor Doria's work in this direction was to study the possibility of replacing this symmetric power with the surface's Jacobian variety. He showed that there are very interesting relationships between his point of view and Morse-Bott-Floer theory.

In his studies of Monopole Floer homology, Professor Doria concentrated on the hardest and one of the most imprtant aspects – the theory of Coupled Floer homology. This theory has been used to link Monopole Floer homolgy to actual calculations, but in between is extremely difficult infinite-dimensional index theory, and few calculations have been made. When I last talked about this with Professor Doria, he was about to begin calculations of coupled homology for new 3-manifolds. This is very exciting research.

In conclusion, Professor Doria, has been working on interesting and difficult mathematics. He was a regular attendant and contributor to our many seminars, and he was very helpful to our graduate students and postdocs. I hope that he will be able to visit us again soon.

Sincerely yours,

Ronald Fintushel
University Distinguished Professor of Mathematics