

SCHOLARSHIP REPORT

Name: **Jonathan Verner**

Home university: **Charles University in Prague**

Host university: **University of Vienna**

Host institution : **Kurt Gödel Research Centre for Mathematical Logic**

Date of stay: **Winter term 2010/2011**

During my stay at the Kurt Gödel Research Centre for Mathematical Logic, University of Vienna I have attended classes and seminars at the centre, discussed with colleagues, gave presentations and prepared my work for publication. I have focused on studying the properties of **generalized Mathias forcing**.

I have originally intended to extend this work to a large cardinal setting, but in the course of the work and during discussions with prof. Friedman it turned out that better understanding of the case on ω was needed. In particular, the question of when M_U is almost ω^ω -bounding seems to be of some importance. Together with H. Minami I have developed an approach which gives a partial answer (namely when U is nowhere meager and $U^{<\omega}$ is P_+). Another promising approach arose out of the work of J. Zapletal on definable ideals. After discussing the topic with him, it seems highly probable that the forcing M_U (or a variant of it) is in fact Π_1^1 on Σ_1^1 . If this turns out to be true, it would settle the question in a much more satisfactory way.

The discussions with prof. Friedman also outlined the questions that need to be answered before one can try to attack the problem with raising the generalized splitting number. Namely one needs to come up with a preservation theorem for not adding dominating functions when iterating forcing at large cardinals. The successor step seems to work in much the same way as the ω case, although a slight modification needs to be introduced, while the limit step is not clear at all and is open to further investigations.

Classes & seminars:

I have attended a course on **Higher Descriptive Set Theory** (given by prof. Sy D, Friedman). I have attended the research seminar and the student seminar of the KGRC.

Publications:

I have prepared and submitted for publication a paper (co-authored with M. Hrušák): **Adding ultra filters by definable quotients**. I have also prepared for publication two papers: **On strong P-points** (co-authored with A. Blass and M. Hrušák) and **Lonely points revisited**.

I have worked on my doctoral thesis: **Ultrafilters and Independent Systems**, writing a substantial part of it.

Aktion Österreich-Tschechien, Semester- und Jahresstipendien

Talks & Presentations:

I have given a two talks at the student seminar detailing my work on Mathias forcing.

I have visited the Prague Forcing seminar and gave a presentation on my work with M. Hrušák, A. Blass and H. Minami.