

### Assessment on RNDr. Milan Klicpera

I know Mgr. Milan Klicpera since 2008 when he entered our department and started his work under my guidance as a bachelor student. His work during bachelor and diploma studies was oriented to magnetic properties of substituted rare-earth intermetallic compounds and relation of magnetocrystalline anisotropy and crystal structure. As a subject of his PhD thesis (started in October 2011), we decided to focus on cerium intermetallics and effects of substitutions on their magnetic properties. In the first year, Milan studied several compounds with the 1:1:1 stoichiometry. He prepared single crystals and achieved some nice results which he published in several papers. Finally, these results are not included in the thesis to keep reasonable length. In 2012, the work of D. Adroja on vibron states  $\text{CeCuAl}_3$  appeared in PRL and the subject of vibrons, kind of magnetoelastic interaction, attracted Milan's attention. He started to collaborate with D. Adroja on the influence of Cu-Al off-stoichiometry in  $\text{CeCuAl}_3$ , prepared several other related series of compounds and mainly the single crystal of  $\text{CeCuAl}_3$  which subsequently studied in detail by all techniques available to him, including very precise crystal structure study and its temperature changes. Then he included in his spectrum of investigated compounds also  $\text{CePd}_2\text{Al}_2$ , which belongs also to a very few materials where the vibron quantum states are observed, and performs many interesting studies on the parent and substituted compounds.

The thesis finally contains two main parts focused on two groups of materials showing vibron states: 1)  $\text{CeCuAl}_3$  and related compounds and 2)  $\text{CePd}_2\text{Al}_2$  and related compounds. We note that the crystal structure of both is very similar. Milan is extremely active and productive, so the work comprises a very broad spectrum of techniques from crystal growth to microscopic techniques. Nevertheless, there still remains a large number of data published in journals but not included in the text of the thesis to keep it clear and not too long. The work is still in progress, Milan performed some key neutron experiments after submission of the thesis, some other are scheduled for next year. In this view, I would consider chapters 4.2.3 and 4.2.4 as preliminary description and subject open for further investigation and discussion.

The last year of his PhD. spent Milan in ILL Grenoble in group of J. Kulda and under guidance of M. Boehm by the new ThALES instrument. In ILL, he not only performed his research or work by the ThALES, but was extremely useful for all activities of our department in ILL. He in fact participated in all our experiments, performed many preliminary test measurements, so I can already hardly imagine our activities in ILL without Milan. He became already quite experienced neutron scientist, beside ILL, he performed experiments at ISIS, CEA Saclay, PSI, HZB Berlin. He participated on the Summer School on Condensed Matter Research

organized by PSI, IFF Spring School by Forshungszentrum Jülich and HERCULES course by ILL.

The results of his work Milan Klicpera presented in 24 papers, 15 of them being the first author. There is already 11 citations without self-citations. In case of successful defense, he plans to continue as post-doc in ILL and I hope he will then return to our faculty, become our neutron expert and perhaps lead a small group focused on vibron states.

Prague, 25.11. 2015

Doc. Pavel Javorský. Dr.