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Letter of Recommendation for: Mr. Markus Friedl

To Whom It May Concern:

In the spring of 1999 the Relativistic Heavy Ion Group at the Massachusetts Institute of Technology (MIT), of which I am the leader, invited Mr. Markus Friedl to work with us for three months on the Phobos Research Project.

Phobos is an \$8million detector being built for a new nuclear collider, RHIC, at the Brookhaven National Laboratory (BNL), which will produce matter at extremely high energy density. At RHIC we hope to reproduce and study the conditions that existed in the universe a millionth of a second after the big bang.

In the Phobos detector we use the charge deposited in silicon wafers to detect and track nuclear particles. Such wafers, with associated electronic readout, are called "silicon detectors".

When Mr. Friedl came to MIT, his first task was to design and carry out a sequence of systematic tests on different silicon detectors, using calibration pulses and radioactive sources to determine their signal properties. Through his measurements he was able to precisely determine the relative signal amplitude and uniformity of detectors with different geometry. He was also able to determine the influence of the double metal readout structure on the properties of the signal. The results of his very precise measurements will allow us to correct signals for detector effects.

While working on these tests Mr. Friedl demonstrated an outstanding knowledge of electronics and nuclear instrumentation. He showed that he is excellent not only in handling hardware but also in software and data analysis.

During the second half of his stay at MIT, Mr. Friedl made another major contribution to the Phobos project when he participated in tests of the first front end controller (FET) prototype,

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and the installation of the complete silicon detector readout system at BNL. In close collaboration with MIT electronics engineers, Mr. Friedl tested the whole signal path in the FEC. His measurements were crucial for establishing how well the FEC was functioning and determining what changes need to be made before full scale production of the FEC's could begin. This work required him to get familiar with the functionality and properties of a new system in a very short time, which he managed extremely well. It also showed that he can work well with a large group of researchers.

From his work at MIT, it is obvious to me that Mr. Friedl is an extremely gifted individual. He is a first rate researcher and engineer. Technically he is comparable to the best MIT Ph.D. students. Furthermore, in addition to being technically talented he has excellent analytical skills and is very creative. These strengths allow him to solve complex problems in a short time. Mr. Friedl is very careful and precise, has a very pleasant personality and works very hard; all of which make him an ideal member of a research team.

If he was interested, I would be delighted if he came to MIT to do a Ph.D. or joined us again on some future research project.

Sincerely,



Wit Busza,
F.L. Friedman Professor of Physics

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