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## **Knocking on surfaces : interactions of hyperthermal particles with metal surfaces**

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## List of publications

This thesis is based on the following publications:

### Chapter 2

H. Ueta, M. A. Gleeson and A. W. Kleyn

*Scattering of Hyperthermal Argon Atoms from Clean and D-covered Ru(0001) Surfaces*

Accepted by The Journal of Chemical Physics

### Chapter 3

H. Ueta, M. A. Gleeson and A. W. Kleyn

*The Interaction of Hyperthermal Argon Atoms with CO-covered Ru(0001): Scattering and Collision-Induced Desorption*

Submitted

### Chapter 4

H. Ueta, I. M. N. Groot, M. A. Gleeson, S. Stolte, G. C. McBane, L. B. F. Juurlink and A. W. Kleyn

*CO Blocking of D<sub>2</sub> Dissociative Adsorption on Ru(0001)*

CHEMPHYSCHEM, **9** (2008) 2372.

### Chapter 5

H. Ueta, M. A. Gleeson and A. W. Kleyn

*Scattering of Hyperthermal Nitrogen Atoms from the Ag(111) Surface*

The Journal of Physical Chemistry A, **113** (2009) 15092.

### Chapter 6

H. Ueta, M. A. Gleeson and A. W. Kleyn

*The Interaction of Hyperthermal Nitrogen with N-covered Ag(111)*

In preparation

## List of publications

In addition, the author has contributed to the following articles:

I. M. N. Groot, H. Ueta, M. J. T. C. van der Niet, A. W. Kleyn and L. B. F. Juurlink  
*Supersonic molecular beam studies of dissociative adsorption of H<sub>2</sub> on Ru(0001)*  
The Journal of Chemical Physics, **127** (2007) 244701.

H. Ueta, M. Saida, C. Nakai, Y. Yamada, M. Sasaki and S. Yamamoto  
*Highly oriented monolayer graphite formation on Pt(111) by a supersonic methane beam*  
Surface Science, **560** (2004) 183.

## **Curriculum vitae**

The author of this thesis, Hirokazu Ueta (植田 寛和), was born on October 30, 1980 in Ibaraki, Japan. In 2001, he graduated from Ibaraki National College of Technology in Ibaraki, Japan. In 2003, he received a Bachelor of Engineering from the College of Engineering Sciences, Tsukuba University. In 2005, he received a Master of Engineering from the Graduate School of Pure and Applied Sciences, Tsukuba University. In September of the same year, he started his PhD research at the FOM institute for Plasma Physics Rijnhuizen in Nieuwegein, the Netherlands, under the supervision of Prof. Dr. Aart W. Kleyn and Dr. Michael A. Gleeson. In 2006, he participated in experiments at Leiden University as part of collaboration with the group of Dr. L. B. F. Juurlink. Parts of the research described in this thesis have been presented at national and international conferences and workshops.



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First of all, I would like to express my heartfelt gratitude to my promoter, Aart W. Kleyn for his encouragement and support. I still remember that when I arrived in the Netherlands for my job interview, you and Steven were waiting for me at Schiphol airport. More than 5 and half years have passed since that interview. By my exposure to your enthusiasm and great breadth of knowledge, I learned and experienced a lot. These experiences are the pearl beyond price for me. I also cannot thank my daily supervisor Mike A. Gleeson enough. I cannot imagine that this thesis would have existed without your dedicated support and help. In addition, I have a great deal of respect for the former students and researchers who were involved in HARPOEN/cascaded arc source to date. Although HARPOEN, including the cascaded arc source, was a really tough partner for me, I am thankful to it for giving the opportunity to meet very interesting science.

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I am grateful to the authors in the bibliography of each chapter. My PhD study is built on the basis of your previous research. I also gratefully acknowledge the referees of the published papers, which are the basis of some of the chapters, for giving very fruitful comments.

I moved to the nanolayer Surface Interface (nSI) department from the Plasma Surface Interaction (PSI) department in the middle of my PhD programme. I am grateful to all my past and current colleagues. I especially like to mention some people. I thank Prof. Fred Bijkerk, as the department head, for allowing me freedom in research. I am also thankful to Eric and Andrey for their hospitality in the nSI department. Nobody wants to break their apparatus, but still break-downs often occur. Without technical help it would not have been possible to do experiments with

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For about 9 months of my PhD I participated in the experiments at Leiden University. I am thankful to Prof. Marc Koper for permitting to join the group freely. There, I met another molecular beam apparatus POTVIS. I am very thankful to Ludo and Irene that you generously accepted me. I enjoyed myself and learned a lot during the experiments with you. Junjun, you also helped me, thank you. After I left Leiden, we kept in touch and you stimulated and helped me. I want to express my gratitude to Prof. George C. McBane and Prof. Steven Stolte. Your great support led to chapter 4. Although it is a pity that we met only once or twice, e-mail was a great tool for discussions with you. I learned a great deal from our e-mail communications. I am also thankful to POTVIS for providing great science.

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Hirokazu Ueta, October 2010