


CURRICULUM VITAE

Name	Martin Setvin	
Work Address	Institute of Applied Physics, TU Wien Wiedner Hauptstrasse 8-10/134, 1040 Vienna	
Phone	+4315880113458	
E-mail	setvin_at_iap.tuwien.ac.at	
Date of Birth	September 13 th , 1982	
Place of birth	Pilsen, Czech Republic	
Nationality	Czech	
Social Status	Married, 2 children	
Webpage	https://www.iap.tuwien.ac.at/www/surface/group/setvin	
Google Scholar	https://scholar.google.com/citations?hl=en&user=hKv36R0AAAAJ	

Education

Ph.D. Degree:

Charles University in Prague, Czech Republic, Physics of Nanostructures (graduated 23.1.2012)

Master Degree:

Charles University in Prague, Czech Republic, Physics of Surfaces and Ionized Media
(graduated 22.9.2006)

Professional Experience

- June 2018 – finished habilitation at the Vienna University of Technology
- from July 2015 – present: Assistant professor at the Vienna University of Technology
- March 2012 – July 2015: Postdoctoral researcher at the Vienna University of Technology (Surface physics group of Prof. Ulrike Diebold)
- June 2009 – February 2012 – Academy of Sciences of the Czech republic - researcher position in the Nanosurf group of Dr. Pavel Jelinek
- January 2008 – November 2008 – research stay at the National Institute for Materials Science, Tsukuba, Japan (International Joint Graduate Fellowship program). Host researcher: Prof. Kazushi Miki
- October 2006 – January 2012: PhD student at Charles University in Prague, Faculty of Mathematics and Physics under supervision of Prof. Ivan Ostadal

Research expertise

- Scanning tunneling microscopy and spectroscopy (STM, STS)
- Atomic force microscopy (AFM)
- Basic analysis techniques used in surface science (XPS, UPS, ISS, LEED, ...)
- Oxide surfaces
- Silicon surfaces
- Surface chemistry, adsorption of molecules
- Photochemistry, light-induced processes at surfaces
- Materials electronic structure

Languages

English (excellent spoken and written)

Czech (native speaker)

German (B1 level)

Japanese (basics)

Hobbies

Family, sports (hiking, cycling, squash, soccer, swimming, ...)

List of 10 key publications (* = corresponding author)

1. *M. Setvin, M. Reticcioli, F. Poelzleitner, J. Hulva, M. Schmid, L. A. Boatner, C. Franchini, U. Diebold *Polarity compensation mechanisms on the perovskite surface KTaO_3 (001)* **Science** 359, 572-575 (2018)
2. M. Setvin, U. Aschauer, P. Scheiber, Y.-F. Li, W. Hou, M. Schmid, A. Selloni, *Reaction of O_2 with Subsurface Oxygen Vacancies on TiO_2 Anatase (101)* **Science** 341, 988 (2013)
3. R. Bliem, E. McDermott, P. Ferstl, M. Setvin, O. Gamba, J. Pavelec, M. A. Schneider, M. Schmid, U. Diebold, P. Blaha, L. Hammer, G. S. Parkinson, *Subsurface Cation Vacancy Stabilization of the Magnetite (001) surface.* **Science** 346, 1215 (2014)
4. *M. Setvin, C. Franchini, X. Hao, M. Schmid, A. Janotti, M. Kaltak, C. G. Van de Walle, G. Kresse, U. Diebold, *Direct View at Excess Electrons in TiO_2 Rutile and Anatase* **Phys. Rev. Lett.** 113, 086402 (2014)
5. *M. Setvin, J. Hulva, G. S. Parkinson, M. Schmid, U. Diebold, *Electron transfer between anatase TiO_2 and an O_2 molecule directly observed by atomic force microscopy,* **PNAS** 114, E2556 (2017)
6. *M. Setvin, U. Aschauer, J. Hulva, T. Simschitz, B. Daniel, M. Schmid, A. Selloni, U. Diebold, *Following the reduction of oxygen on TiO_2 anatase (101) step by step,* **J. Am. Chem. Soc.** 138, 9565 (2016)
7. M. Setvin, X. Hao, B. Daniel, J. Pavelec, Z. Novotny, G. S. Parkinson, M. Schmid, G. Kresse, C. Franchini, U. Diebold, *Charge Trapping at the Step Edges of TiO_2 Anatase (101)* **Angew. Chem. Intl. Ed.** 53, 4714 (2014)
8. *M. Setvin, P. Mutombo, M. Ondracek, Z. Majzik, M. Svec, V. Chab, P. Sobotik, I. Ostadal, P. Jelinek, *Chemical Identification of Single Atoms in Heterogeneous III-IV Chains on $\text{Si}(100)$ Surface by Means of nc-AFM and DFT Calculations* **ACS NANO** 6, 6969 (2012)
9. *M. Setvin, X. Shi, J. Hulva, T. Simschitz, G. S. Parkinson, M. Schmid, C. Di Valentin, A. Selloni, U. Diebold, *Methanol on Anatase TiO_2 (101): Mechanistic insights into photocatalysis,* **ACS Catalysis** 7, 7081 (2017)
10. M. Setvin, M. Wagner, M. Schmid, G. S. Parkinson, U. Diebold, *Surface point defects on bulk oxides: atomically-resolved scanning probe microscopy,* **Chem. Soc. Rev.** 46, 1772 (2017)

Full list of publications

1. *M. Setvin, M. Reticcioli, F. Poelzleitner, J. Hulva, M. Schmid, L. A. Boatner, C. Franchini, U. Diebold *Polarity compensation mechanisms on the perovskite surface $KTaO_3(001)$* **Science** 359, 572-575 (2018)
2. F. Kraushofer, Z. Jakub, M. Bichler, J. Hulva, P. Drmota, M. Weinold, M. Schmid, M. Setvin, U. Diebold, P. Blaha, G. S. Parkinson *Atomic structure of the hematite $\alpha\text{-Fe}_2\text{O}_3(1-102)$ R-cut surface* **J. Phys. Chem. C** 122, 1657-1669 (2018)
3. D. Halwidl, W. Mayr-Schmölzer, M. Setvin, Z. Mao, M. Schmid, F. Mittendorfer, J. Redinger, U. Diebold *A Full Monolayer of Superoxide: Oxygen Activation on the Unmodified $Ca_3Ru_2O_7(001)$ Surface* **J. Mat. Chem. A** 6, 5703 (2018), DOI: 10.1039/C8TA00265G
4. M. Wagner, M. Setvin, M. Schmid, U. Diebold *Sexiphenyl on $Cu(100)$: nc-AFM tip functionalization and identification* **Surf. Sci.**, accepted (2018), DOI: 10.1016/j.susc.2018.03.004
5. M. Wagner, J. Hofinger, M. Setvin, L. A. Boatner, M. Schmid, U. Diebold *Adsorption and monolayer formation of para-sexiphenyl on $In_2O_3(111)$ investigated with STM/AFM* **ACS Appl. Mater. Interfaces** 10, 14175 (2018)
6. M. Meier, J. Hulva, Z. Jakub, J. Pavelec, M. Setvin, M. Schmid, U. Diebold, C. Franchini, G. S. Parkinson *Water Agglomerates on $Fe_3O_4(001)$* **PNAS**, 201801661 (2018), DOI:10.1073/pnas.1801661115
7. M. Reticcioli, M. Setvin, M. Schmid, U. Diebold, C. Franchini *Formation and dynamics of small polarons on the Rutile $TiO_2(110)$ surface* **Phys. Rev. B**, 98, 045306 (2018), DOI: 10.1103/PhysRevB.98.045306
8. *M. Setvin, X. Shi, J. Hulva, T. Simschitz, G. S. Parkinson, M. Schmid, C. Di Valentin, A. Selloni, U. Diebold, *Methanol on Anatase $TiO_2(101)$: Mechanistic insights into photocatalysis*, **ACS Catalysis** 7, 7081 (2017)
9. M. Reticcioli, *M. Setvin, X. Hao, P. Flauger, G. Kresse, M. Schmid, U. Diebold, C. Franchini, *Polaron-driven surface reconstructions*, **Phys. Rev. X** 7, 031053 (2017)
10. *M. Setvin, H. Wang, T. Simschitz, M. Schmid, G. S. Parkinson, C. Di Valentin, A. Selloni, U. Diebold, *Formaldehyde Adsorption on the Anatase $TiO_2(101)$ Surface: Experimental and Theoretical Investigation* **J. Phys. Chem. C** 121, 8914 (2017)
11. *M. Setvin, J. Hulva, G. S. Parkinson, M. Schmid, U. Diebold, *Electron transfer between anatase TiO_2 and an O_2 molecule directly observed by atomic force microscopy*, **PNAS** 114, E2556 (2017)
12. M. Setvin, M. Wagner, M. Schmid, G. S. Parkinson, U. Diebold, *Surface point defects on bulk oxides: atomically-resolved scanning probe microscopy*, **Chem. Soc. Rev.** 46, 1772 (2017)
13. *M. Setvin, U. Aschauer, J. Hulva, T. Simschitz, B. Daniel, M. Schmid, A. Selloni, U. Diebold, *Following the reduction of oxygen on TiO_2 anatase (101) step by step*, **J. Am. Chem. Soc.** 138, 9565 (2016)
14. L. A. Miccio, M. Setvin, M. Muller, M. Abadia, et. al., *Interplay between steps and oxygen vacancies on curved $TiO_2(110)$* , **Nanoletters** 16, 2017 (2016)
15. *M. Setvin, M. Schmid, U. Diebold, *Aggregation and electronically induced migration of oxygen vacancies in TiO_2 anatase*, **Phys. Rev. B** 91, 195403 (2015)
16. *M. Setvin, M. Buchholz, W. Hou, C. Zang, B. Stoeger, J. Hulva, T. Simschitz, X. Shi, J. Pavelec, G. S. Parkinson, M. Xu, Y. Wang, M. Schmid, Ch. Wöll, A. Selloni, U. Diebold, *A Multitechnique Study of CO Adsorption on TiO_2 Anatase (101) Surface*, **J. Phys. Chem. C** 119, 21044 (2015)

17. *M. Setvin, C. Franchini, X. Hao, M. Schmid, A. Janotti, M. Kaltak, C. G. Van de Walle, G. Kresse, U. Diebold, *Direct View at Excess Electrons in TiO₂ Rutile and Anatase*
Phys. Rev. Lett. 113, 086402 (2014)
18. M. Setvin, X. Hao, B. Daniel, J. Pavelec, Z. Novotny, G. S. Parkinson, M. Schmid, G. Kresse, C. Franchini, U. Diebold, *Charge Trapping at the Step Edges of TiO₂ Anatase (101)*
Angew. Chem. Intl. Ed. 53, 4714 (2014)
19. R. Bliem, E. McDermott, P. Ferstl, M. Setvin, O. Gamba, J. Pavelec, M. A. Schneider, M. Schmid, U. Diebold, P. Blaha, L. Hammer, G. S. Parkinson, *Subsurface Cation Vacancy Stabilization of the Magnetite (001) surface.*
Science 346, 1215 (2014)
20. *M. Setvin, B. Daniel, U. Aschauer, W. Hou, Y.-F. Li, M. Schmid, A. Selloni, U. Diebold, *Identification of adsorbed molecules via STM manipulation: CO, H₂O and O₂ on TiO₂ anatase (101)*
Phys. Chem. Chem. Phys. 16, 21524 (2014)
21. *M. Setvin, B. Daniel, V. Mansfeldova, L. Kavan, P. Scheiber, M. Fidler, M. Schmid, U. Diebold, *Surface preparation of TiO₂ anatase (101): Pitfalls and how to avoid them*
Surf. Sci. 626, 61 (2014)
22. M. Setvin, U. Aschauer, P. Scheiber, Y.-F. Li, W. Hou, M. Schmid, A. Selloni, *Reaction of O₂ with Subsurface Oxygen Vacancies on TiO₂ Anatase (101)*
Science 341, 988 (2013)
23. P. Sobotik, M. Setvin, P. Zimmermann, P. Kocan, I. Ostadal, P. Mutombo, M. Ondracek, P. Jelinek, *Emergence of State at Fermi Level due to the formation of In-Sn heterodimers on Si(100)-2x1*
Phys. Rev. B 88, 205406 (2013)
24. J. de la Figuera, Z. Novotny, M. Setvin, TJ Liu, ZQ Mao, G. Chen, AT N'Diaye, M. Schmid, U. Diebold, A. K. Schmid, G. S. Parkinson, *Real-Space Imaging of the Verwey Transition at the (100) Surface of Magnetite*
Phys. Rev. B 88, 161410 (2013)
25. *M. Setvin, P. Mutombo, M. Ondracek, Z. Majzik, M. Svec, V. Chab, P. Sobotik, I. Ostadal, P. Jelinek, *Chemical Identification of Single Atoms in Heterogeneous III-IV Chains on Si(100) Surface by Means of nc-AFM and DFT Calculations*
ACS NANO 6, 6969 (2012)
26. *M. Setvin, J. Javorsky, Z. Majzik, P. Sobotik, P. Kocan, I. Ostadal: *Competition between thermally activated and tip-induced hopping of indium atoms on Si(100) surface*
Phys. Rev. B 85, 081403(R) (2012)
27. *M. Setvin, J. Javorsky, D. Turcinkova, I. Matolinova, P. Sobotik, P. Kocan, I. Ostadal: *Ultrasharp tungsten tips – characterization and nondestructive cleaning*
Ultramicroscopy 113, 152 (2012)
28. Z. Majzik, M. Setvin, A. Bettac, A. Feltz, V. Chab, P. Jelinek: *Simultaneous Current, force and dissipation measurements on the Si(111)-(7x7) surface with an optimized qPlus AFM/STM technique*
Beilstein Journal of Nanotechnology 3, 249 (2012)
29. P. Kocan, P. Sobotik, P. Matvija, M. Setvin, I. Ostadal: *An STM study of desorption-induced thallium structures on the Si(111) surface*
Surface Science 606, 991 (2012)
30. *Martin Setvin, Veronika Brazdova, David R. Bowler, Kota Tomatsu, Kan Nakatsuji, Fumio Komori, Kazushi Miki: *Electronic structure of Si(100)-16x2 studied by Scanning Tunneling Spectroscopy and Density Functional Theory*
Phys. Rev. B 84, 115317 (2011)
31. Martin Setvín, Veronika Brázdová, Kazushi Miki, and David R. Bowler: *Step Structure of Si(110)-(16x2) and adsorption of H₂O*
Phys. Rev. B 82, 125421 (2010)
32. Jakub Javorský, James H. G. Owen, Martin. Setvín and Kazushi Miki: *Electronic structure of Bi lines on clean and H-passivated surfaces*
J. Phys. Cond. Matter 22, 175006 (2010)

33. Pavel Kocán, Pavel Sobotík, Ivan Ošťádal, Martin Setvín, and Stanislav Haviár: *Modelling growth of one-dimensional islands: Influence of reactive defects*
Phys. Rev. E 80, 061603 (2009)
34. Jakub Javorský, Martin Setvín, Ivan Ošťádal, Pavel Sobotík, and Miroslav Kotrla: *Heterogeneous nucleation and adatom detachment at one-dimensional growth of In on Si(100)-2×1*
Phys. Rev. B 79, 165424 (2009)
35. K. Sakamoto, M. Setvín, K. Mawatari, P. E. J. Eriksson, K. Miki, R. I. G. Uhrberg: *Electronic structure of the Si(110)-16×2 surface*
Phys. Rev. B 79, 045304 (2009)
36. Ivan Ošťádal, Jakub Javorský, Pavel Kocán, Pavel Sobotík and Martin Setvín: *Kinetics of In growth on Si(100)-2×1 at low coverage – STM study*
Journal of Physics: Conference series 100, 072006 (2008)
37. Pavel Kocán, Pavel Sobotík, Ivan Ošťádal, Jakub Javorský and Martin Setvín: *Stability of In rows on Si(100) during STM observation*
Surface Science 601, 4506 (2007)

List of invited conference talks

1. ACS fall meeting 2013, Indianapolis: *TiO₂ anatase (101): (sub)surface oxygen vacancies and O₂ adsorption*
2. EMRS 2014 Fall meeting, Warsaw: *A direct view at polarons in TiO₂ rutile and anatase*
3. 2015 MRS spring meeting, San Francisco: *Excess electrons in TiO₂ rutile and anatase: Delocalized solutions and Localized small Polarons*
4. ICMAT2015 & IUMRS-ICA2015, Singapore: *Excess Electrons in TiO₂ – delocalized solutions in anatase vs. localized polarons in rutile*
5. DPG meeting 2016, Regensburg – *Surface chemistry of oxygen and water on anatase TiO₂ (101)*
6. ACS meeting San Diego 2016 – *Surface chemistry of oxygen and water on anatase TiO₂ (101)*
7. FOXSI meeting Vienna 2016 – *Surface chemistry of oxygen and water on anatase TiO₂ (101)*
8. DPG Meeting 2017, Dresden, “Post-deadline talk” *KTaO₃ (001) surface in vacuum and water*
9. Psi-k workshop York 2017 – *Cleaved KTaO₃ surfaces studied by AFM/STM*
10. FOXSI meeting Vienna 2017 – *Cleaved KTaO₃*
11. Multinational Congress of Microscopy 2017 Rovinj (Slovenia) – September 2017
12. ELIps workshop, Prague, October 2017
13. Mc2 workshop “Materials, Characterization, and Catalysis”, Zurich, January 2018
14. DPG meeting 2018, Berlin – *Bulk-terminated surfaces of KTaO₃ and SrTiO₃ studied by combined STM/AFM*
15. ICN+T 2018, Brno - *Bulk-terminated surfaces of SrTiO₃ and KTaO₃: Imaging, stability and reactivity*

Invited seminar talks:

16. Karlsruhe institute of Technology, Karlsruhe (2013)
17. Charles University, Prague (2014)
18. Heyrovsky Institute, Prague (2014)
19. Academy of Sciences of the Czech Republic, Prague (2014)
20. Palacky University, Olomouc, Czech Republic (2015)
21. Basel, Switzerland (2016)
22. Academy of Sciences of the Czech Republic, Prague (2016)
23. CEITEC, Brno, Czech Republic (2016)
24. TU Munich (November 2017)
25. University of Bern (November 2017)
26. Paul Scherrer Institute, Zurich, Switzerland (November 2018)
27. University of Leoben, Leoben, Austria (November 2018)

List of contributed conference talks

28. ICFS Prague 2011
29. Nc-AFM Lindau 2011
30. COST workshop Prague 2012
31. ECOSS Edinburgh 2012
32. 3S symposium, Sweden, 2013
33. Czech-Austrian Electrocatalysis workshop, Hnanice 2013
34. OePG Linz 2014
35. 3S symposium, Austria, 2014
36. DPG Dresden, 2014
37. ECOSS, Turkey, 2014
38. 3S symposium 2015, France
39. OePG Wien, 2015
40. 3S symposium, Austria, 2016
41. Nc-AFM, Nottingham, 2016
42. OePG Wien, 2016
43. DPG meeting Dresden, 2017
44. 3S symposium, Switzerland, 2017
45. 3S symposium, Austria, 2018

Patents

M. Schmid, M. Setvin, U. Diebold: 1B A 50765/2016: VORRICHTUNG ZUM SCHWINGUNGSISOLIEREN EINER LAST, WO 2018/037102 A1

Teaching activities

- Basic principles of physics I, II, III (Exercises for classical mechanics, thermodynamics, electricity and magnetism, optics, quantum mechanics)
- Surface Science class (50% shared with Prof. Ulrike Diebold)
- Physics Praktikum (co-supervision with Prof. Michael Schmid)

List of diploma and dissertation works (co-supervision with U. Diebold)

Currently supervising:

Zhichang Wang: Postdoc
Igor Sokolovic: PhD. Thesis
Manuel Ulreich: Projectwork

Finished works:

Flora Poelzleitner: Diploma thesis
Manuel Ulreich: Bachelor thesis
Benjamin Daniel: Diploma thesis
Benjamin Daniel: Projectwork
Thomas Simschitz: Diploma thesis
Thomas Simschitz: Projectwork
Martin Calkovsky: Erasmus-project
Jakub Piastek: Erasmus-project