

Scientific CV

Dr. Barbara Katharina Geist (Wünschek)

Physicist

Division of Nuclear Medicine

Department of Biomedical Imaging and Image-guided Therapy

Währinger Gürtel 18-20, Floor 3L, 1090 Vienna, Austria

Phone: +43-1-40400-58720

Email: barbara.geist@meduniwien.ac.at

ORCID: <https://orcid.org/0000-0003-0098-0048>

Current Position

Since 08/2024 **Adjunct PI** at the Ludwig Boltzmann Institute for Network Medicine
since 01/2024 **Head of Computational Nuclear Medicine**, Division of Nuclear Medicine, Medical
University of Vienna

Scientific Journey

08/2018 – now **Senior Scientist** Computational Nuclear Medicine, Division of Nuclear Medicine,
Medical University of Vienna
08/2023 – 07/2024 **Interruption** (maternity leave)
11/2020 – 11/2021 **Interruption** (maternity leave)
2014 – 2018 **Postdoc** at the Division of Nuclear Medicine, Medical University of Vienna
2013 – 2014 **Medical physicist** at AKH Wien, Division of Nuclear Medicine
2012 – 2013 **Postdoc** at Stefan-Meyer-Institute for Subatomic Physics, ASACUSA group,
experimental work at CERN
2008 – 2012 **Scientific worker** at Stefan-Meyer-Institute for Subatomic Physics, SIDDHARTA group,
experimental work at KEK and J-PARC (Japan), Frascati (Italy) for a total of 6 months
2007 – 2008 **Scientific referent** at the Dean's office, Faculty of Physics, University of Vienna
07/2005 **Scientific assistant** at the Institute for Isotope Research and Nuclear Physics,
University of Vienna, experimental work at DESY (Germany) and C2RMF Louvre
(France)

Education

05/2012 **PhD (Dr.rer.nat.)** in experimental particle physics (Supervisor: Eberhard Widmann)
„Comparison of the measured X-ray yields of kaonic helium-3 and helium-4“
09/2007 **Diploma (Mag.rer.nat.)** in nuclear physics (Supervisor: Walter Kutschera)
„A study of proton irradiation of paper to assess its influence on PIXE analysis of art
objects“
06/2001 **Matura** Gymnasium Sacré Coeur, Vienna

Recent research topics

myocardial metabolism in the regime of SGLT2 inhibition
organ connectomes and metabolic networks
effects of stress
prostate cancer
renal transporter quantification
image quantification

Further trainings:

Courses on:
teaching and didactics (2017-2020), team leading (2021), project management (2021), conflict management (2021), negotiations (2024), kinetic modeling (2018), mediation analysis (2022), PET/MRI (2015), good clinical practice (2021), outreach (2021)

External Funding:

Siemens project (2017-2018), funding: €70 000, topic: “Kidney function with PET/CT”
Siemens project (since 2019), funding part 1: € 3975, topic: “Renal scintigraphy in 4D”
LBi for Network Medicine (since 09/2024): Adjunct-PI with a fully funded PhD position (70k/year)
Applied for (by End of March 2025): WWTF, KLIF, CDL

Awards:

Dora Brücke-Teleky Award 2023 3rd place

Memberships:

2023 – 2027	European Association of Nuclear Medicine (EANM) Member Physics Committee
2025 – 2027	Member of the ESMIT committee (EANM)
2018 – 2021	Member of the management committee of Parenchima (COST action)

Teaching

Lectures in scientific methods and statistics, special lectures in nuclear medicine, mathematics, physics and radiation protection.
Student supervision: autonomous supervision of 4 Master- and Bachelor-students (FH Campus Wien, TU Wien, Universität Wien), co-supervision of Master- and PhD students (TU Wien, Universität Wien, Meduni Wien), PhD committee member (Université de Liège).

Research skills and experience (key words)

solid-state detectors, detector electronics and logic, accelerator physics, radioactivity & dosimetry, spectroscopy, Monte-Carlo simulations, strange atoms, big data analysis, software development, development of mathematical models, kinetic modeling, network science, hybrid imaging, methods in nuclear medicine, image quantification, statistics, team leading, conflict management, GCP, teaching

Further contributions and achievements

Study PI / applicant of human (12) and animal (1) studies

Reviewer: *Anti-Infective Agents, EJNMMI Physics, JNM, EJR, Frontiers in Physics, JCM, AIA, Scientific Reports, Applied Sciences, Electronics, EJNMMI*

Outreach: “Kinderuni” (2003-2012), “Lange Nacht der Forschung” (2009, 2012), “Spielraum Physik” (2005)

Publications

36 peer-review publications, 13 first/last/corresponding-author

> 30 conference contributions

ISI web of knowledge, effective Feb 2025: 477 citations, 13 citations / item, H-Index 10

Personal information

born: April 13th 1983, Vienna

family status: married (unmarried name: Wünschek), 2 children (born 2021 and 2023)



B. K. Geist, 19.02.2025

List of Publications

First, Last, Corresponding

1. **Geist**, BK; Ramirez, JC; Binder, P; Einspieler, H; Ibeschitz, H; Langsteger, W; Nics, L; Rausch, I; Diemling, M; Sohlberg, A; Hacker, M; Rasul, S. In vivo assessment of safety, biodistribution, and radiation dosimetry of the [18F]Me4FDG PET-radiotracer in adults. *EJNMMI Res* 2024;14(1):46 doi:10.1186/s13550-024-01098-2
2. **Geist**, BK; Brath, H; Zisser, L; Yu, JS; Fueger, B; Nics, L; Patronas, EM; Kautzky-Willer, A; Hacker, M; Rasul, S. Excretion of glucose analogue with SGLT2 affinity predicts response effectiveness to sodium glucose transporter 2 inhibitors in patients with type 2 diabetes mellitus. *EJNMMI* 2023;50(10):3034 doi:10.1007/s00259-023-06256-7
3. **Geist**, BK; Bammer-Zimmer, R. Effects of Early Toilet Training and Elimination Communication With Respect to Diaper Types. *CLIN PED.* 2023;62(8):901 doi:10.1177/00099228221145268
4. **Geist**, BK; Neufeld, H. Particle-number conservation, causality and linear response in biomedical imaging. *APPL MATH COMP* 2021;409:126418 doi:10.1016/j.amc.2021.126418
5. **Geist**, BK; Xing, HQ; Wang, JN; Shi, XM; Zhao, HT; Hacker, M; Sang, XT; Huo, L; Li, X. A methodological investigation of healthy tissue, hepatocellular carcinoma, and other lesions with dynamic 68Ga-FAPI-04 PET/CT imaging. *EJNMMI Phys* 2021;8(1):8 doi:10.1186/s40658-021-00353-y
6. Pajenda, S; Rasul, S; Hacker, M; Wagner, L; **Geist**, BK. Dynamic 2-deoxy-2[18F] fluoro-D-glucose PET/MRI in human renal allotransplant patients undergoing acute kidney injury. *SCIENTIFIC REPORTS* 2020;10(1):8270 doi:10.1038/s41598-020-65267-8
7. **Geist**, BK; Wang, JN; Wang, XZ; Lin, JZ; Yang, X; Zhang, H; Li, F; Zhao, HT; Hacker, M; Huo, L; Li, X. Comparison of different kinetic models for dynamic 18F-FDG PET/CT imaging of hepatocellular carcinoma with various, also dual-blood input function. *PHYS MED BIO* 2020;65(4):45001 doi:10.1088/1361-6560/ab66e3
8. Rasul, S; **Geist**, BK (corresponding); Brath, H; Baltzer, P; Sundar, LKS; Pichler, V; Mitterhauser, M; Kautzky-Willer, A; Hacker, M. Response evaluation of SGLT2 inhibitor therapy in patients with type 2 diabetes mellitus using 18F-FDG PET/MRI. *BMJ OPEN DIAB RES & CARE* 2020;8(1):e001135 doi:10.1136/bmjdr-2019-001135
9. **Geist**, BK; Baltzer, P; Fueger, B; Hamboeck, M; Nakuz, T; Papp, L; Rasul, S; Sundar, LKS; Hacker, M; Staudenherz, A. Assessment of the kidney function parameters split function, mean transit time, and outflow efficiency using dynamic FDG-PET/MRI in healthy subjects. *EUR J HYBRID IMAGING* 2019;3(1):3 doi:10.1186/s41824-019-0051-9
10. **Geist**, BK; Baltzer, P; Fueger, B; Hamboeck, M; Nakuz, T; Papp, L; Rasul, S; Sundar, LKS; Hacker, M; Staudenherz, A. Assessing the kidney function parameters glomerular filtration rate and effective renal plasma flow with dynamic FDG-PET/MRI in healthy subjects. *EJNMMI Res* 2018;8:37 doi:10.1186/s13550-018-0389-1
11. **Geist**, BK; Diemling, M; Staudenherz, A. Glomerular Filtration Rate and Error Calculation Based on the Slope-Intercept Method with Chromium-51 Ethylenediaminetetraacetic Acid via a New Clinical Software: GFRcalc. *MED PRINC PRACT* 2016;25(4):368 doi:10.1159/000445028
12. **Geist**, BK; Dobrozemsky, G; Samal, M; Schaffarich, MP; Sinzinger, H; Staudenherz, A. WWSSF - a worldwide study on radioisotopic renal split function: reproducibility of renal split function assessment in children. *NUC MED COMM* 2015;36(12):1233 doi:10.1097/MNM.0000000000000380
13. **Wuenscheck**, BK; et al.. STATUS AND PLANS OF EXPERIMENT E17 AT J-PARC. *INTERNATIONAL JOURNAL OF MODERN PHYSICS A.* 2011;26(3-4):604 doi:10.1142/S0217751X11052177

Co-Author

1. Yu, JS; Spielvogel, C; Haberl, D; Jiang, ZW; Özer, Ö; Pusitz, S; **Geist, B**; Beyerlein, M; Tibu, I; Yildiz, E; Kandathil, SA; Buschhorn, T; Schnoell, J; Kumpf, K; Chen, YT; Wu, TT; Zhang, ZQ; Gruenert, S; Hacker, M; Vraha, C. Systemic Metabolic and Volumetric Assessment via Whole-Body [18F]FDG-PET/CT: Pancreas Size Predicts Cachexia in Head and Neck Squamous Cell Carcinoma.CANCERS 2024;16:3352 doi: 10.3390/cancers16193352
2. Einspieler, H; Kluge, K; Haberl, D; Schatz, K; Nics, L; Schmitl, S; **Geist, BK**; Spielvogel, CP; Grubmüller, B; Baltzer, PAT; Kramer, G; Shariat, SF; Hacker, M; Rasul, S. Assessment of PSMA Expression of Healthy Organs in Different Stages of Prostate Cancer Using [68Ga]Ga-PSMA-11-PET Examinations.CANCERS 2024;16:1514 doi: 10.3390/cancers16081514
3. Ferrara, D; Sundar, LKS; Chalampalakakis, Z; **Geist, BK**; Gompelmann, D; Gutschmayer, S; Hacker, M; Kertész, H; Kluge, K; Idzko, M; Langsteger, W; Yu, J; Rausch, I; Beyer, T. Low-dose and standard-dose whole-body [18F]FDG-PET/CT imaging: implications for healthy controls and lung cancer patients.FRONTIERS IN PHYSICS 2024;12:1378521 doi: 10.3389/fphy.2024.1378521
4. Reed, MB; Godbersen, GM; Vraha, C; Rausch, I; de León, MP; Popper, V; **Geist, B**; Nics, L; Komorowski, A; Karanikas, G; Beyer, T; Traub-Weidinger, T; Hahn, A; Langsteger, W; Hacker, M; Lanzenberger, R. Comparison of cardiac image-derived input functions for quantitative whole body [18F]FDG imaging with arterial blood sampling.FRONTIERS IN PHYSIOLOGY 2023;14:1074052 doi: 10.3389/fphys.2023.1074052
5. Rasul, S; **Geist, BK**; Einspieler, H; Fajkovic, H; Shariat, SF; Schmitl, S; Mitterhauser, M; Bartosch, R; Langsteger, W; Baltzer, PAT; Beyer, T; Ferrara, D; Haug, AR; Hacker, M; Rausch, I. Direct Patlak Reconstruction of [68Ga]Ga-PSMA PET for the Evaluation of Primary Prostate Cancer Prior Total Prostatectomy: Results of a Pilot Study.INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES 2023;24:13677 doi: 10.3390/ijms241813677
6. Reed, MB; de León, MP; Vraha, C; Rausch, I; Godbersen, GM; Popper, V; **Geist, BK**; Komorowski, A; Nics, L; Schmidt, C; Klug, S; Langsteger, W; Karanikas, G; Traub-Weidinger, T; Hahn, A; Lanzenberger, R; Hacker, M. Whole-body metabolic connectivity framework with functional PET.NEUROIMAGE 2023;271:120030 doi: 10.1016/j.neuroimage.2023.120030
7. Ferrara, D; Beyer, T; Sundar, LKS; Hacker, M; Langsteger, W; Bartosch, R; Leitinger, I; Ibeschitz, H; **Geist, BK**; Kluge, K; Yu, J; Rausch, I. Comparison of static and dynamic whole-body PET/CT acquisitions with ultra-low-dose and standard-dose [18F] FDG injections in healthy volunteers and lung cancer patients.EUROPEAN JOURNAL OF NUCLEAR MEDICINE AND MOLECULAR IMAGING 2022;49:S227 doi: 10.1016/j.ejnm.2022.04.007
8. Gerges, D; Hevesi, Z; Schmidt, SH; Kapps, S; Pajenda, S; **Geist, B**; Schmidt, A; Wagner, L; Winnicki, W. Tubular epithelial progenitors are excreted in urine during recovery from severe acute kidney injury and are able to expand and differentiate in vitro.PEERJ 2022;10:e14110 doi: 10.7717/peerj.14110
9. Vraha, C; Murgas, M; Rischka, L; **Geist, BK**; Lanzenberger, R; Gryglewski, G; Zenz, T; Wadsak, W; Mitterhauser, M; Hacker, M; Philippe, C; Pichler, V. Simultaneous radiomethylation of [11C]harmine and [11C]DASB and kinetic modeling approach for serotonergic brain imaging in the same individual.SCIENTIFIC REPORTS 2022;12:3283 doi: 10.1038/s41598-022-06906-0
10. Wang, JN; Shao, YW; Liu, BW; Wang, XZ; **Geist, BK**; Li, X; Li, F; Zhao, HT; Hacker, M; Ding, HY; Zhang, H; Huo, L. Dynamic 18F-FDG PET imaging of liver lesions: evaluation of a two-tissue compartment model with dual blood input function.BMC MEDICAL IMAGING 2021;21:90 doi: 10.1186/s12880-021-00623-2
11. Pajenda, S; Kapps, S; Gerges, D; Hoermann, G; Wagner, L; Buchtele, N; **Geist, B**; Strassl, R; Schmidt, A; Winnicki, W. Cytomegalovirus in urinary sediment in patients with acute kidney injury.BMC NEPHROLOGY 2021;22:169 doi: 10.1186/s12882-021-02377-z
12. Klebermass, EM; Mahmudi, M; **Geist, BK**; Pichler, V; Vraha, C; Balber, T; Miller, A; Haschemi, A; Viernstein, H; Rohr-Udilova, N; Hacker, M; Mitterhauser, M. If It Works, Don't Touch It? A Cell-Based Approach to Studying 2-[18F]FDG Metabolism.PHARMACEUTICALS 2021;14:910 doi: 10.3390/ph14090910
13. Hamböck, M; Staudenherz, A; Kainz, A; **Geist, B**; Hecking, M; Doberer, K; Hacker, M; Böhmig, GA. Determinants of the intercept and slope of glomerular filtration rate in recipients of a live donor kidney transplant.WIENER KLINISCHE WOCHENSCHRIFT 2021;133:107 doi: 10.1007/s00508-020-01610-3
14. Sakuma, F; Ajimura, S; Beer, G; Bhang, H; Bragadireanu, M; Buehler, P; Busso, L; Cargnelli, M; Choi, S; Curceanu, C; Enomotoi, S; Faso, D; Fujioka, H; Fujiwara, Y; Fukuda, T; Guaraldo, C; Hashimoto, T; Hayano, RS; Hiraiwa, T; Iio, M; Iliescu, M; Inoue, K; Ishiguro, Y; Ishikawa, T; Ishimoto, S; Ishiwatari, T; Itahashi, K; Iwai, M; Iwasaki, M; Kato, Y; Kawasaki, S; Kienle, P; Kou, H; Ma, Y; Marton, J; Matsuda, Y; Mizoi, Y; Morra, O; Nagae, T; Noumi, H; Ohnishi, H; Okada, S; Oota, H; Piscicchia, K; Lener, MP; Vidal, AR; Sada, Y; Sakaguchi, A; Sato, M; Scordo, A; Sekimoto, M; Shi, H; Sirghi, D; Sirghi, F; Suzumi, K; Suzuki, S; Suzuki, T; Tanida, K; Tatsuno, H; Tokuda, M;

- Tomono, D; Toyoda, A; Tsukada, K; Doce, OV; Widmann, E; **Wuenschek, BK**; Yamaga, T; Yamazaki, T; Yim, H; Zhang, Q; Zmeskal, J.A SEARCH FOR DEEPLY-BOUND KAONIC NUCLEAR STATES BY IN-FLIGHT $^3\text{He}(K^-, n)$ REACTION AT J-PARC.ACTA PHYSICA POLONICA B 2014;45:767 doi: 10.5506/APhysPolB.45.767
15. Bazzi, M; Beer, G; Berucci, C; Bragadireanu, AM; Cargnelli, M; Curceanu, C; d'Uffizi, A; Fiorini, C; Ghio, F; Guaraldo, C; Hayano, RS; Iliescu, M; Ishiwatari, T; Iwasaki, M; Sandri, PL; Marton, J; Okada, S; Pietreanu, D; Ponta, T; Quaglia, R; Vidal, AR; Sbardella, E; Scordo, A; Shi, H; Sirghi, DL; Sirghi, F; Tatsuno, H; Doce, OV; **Wuenschek, B**; Widmann, E; Zmeskal, J.L-series X-ray yields of kaonic ^3He and ^4He atoms in gaseous targets.EUROPEAN PHYSICAL JOURNAL A 2014;50:91 doi: 10.1140/epja/i2014-14091-0
 16. Kuroda, N; Ulmer, S; Murtagh, DJ; Van Gorp, S; Nagata, Y; Diermaier, M; Federmann, S; Leali, M; Malbrunot, C; Mascagna, V; Massiczek, O; Michishio, K; Mizutani, T; Mohri, A; Nagahama, H; Ohtsuka, M; Radics, B; Sakurai, S; Sauerzopf, C; Suzuki, K; Tajima, M; Torii, HA; Venturelli, L; **Wuenschek, B**; Zmeskal, J; Zurlo, N; Higaki, H; Kanai, Y; Rizzini, EL; Nagashima, Y; Matsuda, Y; Widmann, E; Yamazaki, Y.A source of antihydrogen for in-flight hyperfine spectroscopy.NATURE COMMUNICATIONS 2014;5:3089 doi: 10.1038/ncomms4089
 17. Rausch, I; Bergmann, H; **Geist, B**; Schaffarich, M; Hirtl, A; Hacker, M; Beyer, T.Variation of system performance, quality control standards and adherence to international FDG-PET/CT imaging guidelines A national survey of PET/CT operations in Austria.NUKLEARMEDIZIN-NUCLEAR MEDICINE 2014;53:242 doi: 10.3413/Nukmed-0665-14-05
 18. Ishiwatari, T; Bazzi, M; Beer, G; Bombelli, L; Bragadireanu, AM; Cargnelli, M; Curceanu, C; d'Uffizi, A; Fiorini, C; Frizzi, T; Ghio, F; Guaraldo, C; Hayano, RS; Iliescu, M; Iwasaki, M; Kienle, P; Sandri, PL; Longoni, A; Marton, J; Okada, S; Pietreanu, D; Ponta, T; Rizzo, A; Vidal, AR; Sbardella, E; Scordo, A; Shi, H; Sirghi, DL; Sirghi, E; Tatsuno, H; Tudorache, A; Tudorache, V; Doce, OV; Widmann, E; **Wuenschek, B**; Zmeskal, J.Strong-interaction shifts and widths of kaonic helium isotopes.NUCLEAR PHYSICS A 2013;914:305 doi: 10.1016/j.nuclphysa.2012.12.020
 19. Bazzi, M; Beer, G; Bombelli, L; Bragadireanu, AM; Cargnelli, M; Curceanu, C; d'Uffizi, A; Fiorini, C; Frizzi, T; Ghio, F; Guaraldo, C; Hayano, RS; Iliescu, M; Ishiwatari, T; Iwasaki, M; Kienle, P; Sandri, PL; Longoni, A; Marton, J; Okada, S; Pietreanu, D; Ponta, T; Rizzo, A; Vidal, AR; Sbardella, E; Scordo, A; Shi, H; Sirghi, DL; Sirghi, F; Tatsuno, H; Tudorache, A; Tudorache, V; Doce, OV; **Wuenschek, B**; Widmann, E; Zmeskal, J.Measurements of the strong-interaction widths of the kaonic ^3He and ^4He 2p levels.PHYSICS LETTERS B 2012;714:40 doi: 10.1016/j.physletb.2012.06.071
 20. Agari, K; Ajimura, S; Beer, G; Bhang, H; Bragadireanu, M; Buehler, P; Busso, L; Cargnelli, M; Choi, S; Curceanu, C; Enomoto, S; Faso, D; Fujioka, H; Fujiwara, Y; Fukuda, T; Guaraldo, C; Hashimoto, T; Hayano, RS; Hiraiwa, T; Hirose, E; Ieiri, M; Iio, M; Iliescu, M; Inoue, K; Ishiguro, Y; Ishikawa, T; Ishimoto, S; Ishiwatari, T; Itahashi, K; Iwai, M; Iwasaki, M; Kakiguchi, Y; Katoh, Y; Kawasaki, S; Kienle, P; Kou, H; Ma, Y; Marton, J; Matsuda, Y; Minakawa, M; Mizoi, Y; Morra, O; Muto, R; Nagae, T; Naruki, M; Noumi, H; Ohnishi, H; Okada, S; Outa, H; Piscicchia, K; Lener, MP; Vidal, AR; Sada, Y; Sakaguchi, A; Sakuma, F; Sato, M; Sato, Y; Sawada, S; Scordo, A; Sekimoto, M; Shi, HX; Shirakabe, Y; Sirghi, D; Sirghi, F; Suzuki, K; Suzuki, S; Suzuki, T; Suzuki, Y; Takahashi, H; Tanaka, K; Tanaka, N; Tatsuno, H; Tokuda, M; Tomono, D; Toyoda, A; Tsukada, K; Doce, OV; Watanabe, H; Widmann, E; **Wuenschek, BK**; Yamanoi, Y; Yamazaki, T; Yim, H; Zmeskal, J.The K1.8BR spectrometer system at J-PARC.PROGRESS OF THEORETICAL AND EXPERIMENTAL PHYSICS 2012;2012:02B011 doi: 10.1093/ptep/pts039
 21. Bazzi, M; Beer, G; Bombelli, L; Bragadireanu, AM; Cargnelli, M; Corradi, G; Curceanu, C; d'Uffizi, A; Fiorini, C; Frizzi, T; Ghio, F; Girolami, B; Guaraldo, C; Hayano, RS; Iliescu, M; Ishiwatari, T; Iwasaki, M; Kienle, P; Sandri, PL; Longoni, A; Marton, J; Okada, S; Pietreanu, D; Ponta, T; Rizzo, A; Vidal, AR; Scordo, A; Shi, H; Sirghi, DL; Sirghi, F; Tatsuno, H; Tudorache, A; Tudorache, V; Doce, OV; Widmann, E; **Wuenschek, B**; Zmeskal, J.First measurement of kaonic helium-3 X-rays. PHYSICS LETTERS B 2011;697:199 doi: 10.1016/j.physletb.2011.02.001
 22. Zmeskal, J; Bazzi, M; Bragadireanu, M; Bühler, P; Cargnelli, M; Curceanu, C; Ghio, F; Guaraldo, C; Iliescu, M; Ishiwatari, T; Kienle, R; Sandri, PL; Marton, J; Müllner, P; Suzuki, K; Okada, S; Pietreanu, D; Lener, MP; Rizzo, A; Doce, OV; Vidal, AR; Scordo, A; Sirghi, F; Sirghi, D; d'Uffizi, A; Widmann, E; **Wuenschek, B**. The AMADEUS experiment - precision measurements of low-energy antikaon nucleus/nucleon interactions.NUCLEAR PHYSICS A 2010;835:410 doi: 10.1016/j.nuclphysa.2010.01.231
 23. Milota, P; Reiche, I; Duval, A; Forstner, O; Guicharnaud, H; Kutschera, W; Merchel, S; Priller, A; Schreiner, M; Steier, P; Thobois, E; Wallner, A; **Wuenschek, B**; Golser, R.PIXE measurements of Renaissance silverpoint drawings at VERA.NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION B 2008;266:2279 doi: 10.1016/j.nimb.2008.03.005