

CURRICULUM VITÆ

PD Dr. Martin Mkandawire

(PD is *Privatdozent*, a German title equivalent to Associate Professor/Reader)

1. Personal details

name: Martin Mkandawire Title: PD Dr. rer. nat. habil.
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2. Major research interest

- theoretical:
- Thermodynamics and kinetics in natural aquatic system, thermodynamic and geochemical modelling of mine water
 - Sorption, 2 dimension geochemical transport and bioaccumulation modelling, toxicological modelling and finite element analysis
- experimental: Environmental Nanotechnology
- Development of Lab-on-chip technology for environmental application
 - Use of nanomaterials for catalysis in aquatic remediation and extraction of precious metals especially from surface mine waters
 - Biomineralisation as procedure for decontamination of water and sediments in abandoned mining sites
 - Development of nano- and bioanalytical procedure for characterisation of biomaterials and nanoparticles and use of metallic nanomaterials for cell imaging
- Biogeochemistry and Environmental Chemistry
- Development of cost-effective remediation techniques based on biotechnology and nanotechnology methods that can make mine water treatment commercially attractive
 - Fate, effects and transport of pollutants in aquatic systems under natural chemical speciation and dynamics, environmental and analytical chemistry, biogeochemistry of uranium and arsenic in mine water and sediments
 - Generation of electricity using metal reducing anaerobic bacteria in sediments of water treatment ponds in former mining sites

- Molecular-level investigation of inorganic (and limited organic) matter-mineral interactions; contaminant interactions with water, and environmental metabolic profiling (metabolomics)

3. Qualifications

(a) Professional

2009: **Privatdozent (Associate Professor) in Biogeochemistry**
(a German professional qualification/rank equivalent to Associate Professor or Reader in geochemistry awarded after academic qualification of *habilitation*)

(b) Academic

2005-2009: **Habilitation (equivalent to DSc)** with *venia legend* in Biogeochemistry, Technische Universität Dresden.

Thesis title: Resource Stoichiometry and Homeostasis in Aquatic Biogeochemistry of Uranium and Arsenic.

2000-2004: **Dr. rer. nat. (PhD)** in Environmental Engineering/Chemistry, Technische Universität Dresden (grade: magna cum laude).

Thesis title: Fate and Effects of Uranium and Arsenic in Surface Water of Abandoned Uranium Mines: Investigations with *Lemna Gibba* L.

1996-1998: **Master of Science** (specialising in radioecology), Technische Universität Dresden (Grade: Distinction (grade 1.0))

Thesis title: Influence of natural uranium and its decay products on the ecosystem of Kayerekera in Northern Malawi.

1995: **Postgraduate Diploma** in Environmental Management, Technische Universität Dresden

1988-1992: **Bachelor of Science** (majoring in chemistry with minor in biology and mathematics), University of Malawi

1984-1988: **O-level** (University entry), Malawi Schools Certification of Education Examination – Malawi Examination Board

4. Career history

Since 2009: Privatdozent (Associate Professor) in Biogeochemistry and Environmental Nanotechnology, Technische Universität Dresden

2005-2009: Post Doctoral Research Fellow, Lecturer and Research fellow in Environmental Nanotechnology, Institute of Materials Sciences, Technische Universität Dresden

2000-2004: Doctoral Research Fellow in aquatic toxicology and remediation of radioactive contamination, Institute of General Ecology and Environmental Protection, Technische Universität Dresden

1999–2000: State of Environmental Reporting (SOER) System Specialists and Acting Project Leader for Capacity Development in Environment Project, Malawi Government-DANIDA Environmental Support Programme Sector through Capacity Development in Environmental Project, Private Bag B495, Lilongwe 3. Malawi

- 1996-1998: Graduate research fellow and studentship, Institute of General Ecology and Environmental Protection, Technische Universität Dresden, 01062 Dresden. Germany.
- 1994–1998: Occupational Safety and Health Officer (Chemistry), Director of Occupational Safety and Health, Private Bag 344, Lilongwe. Malawi. (with educational leaves and leave of absence)
- 1992–1994: Nutrition Monitor and Environmental Project Assistant, Canadian Physician for Aid and Relief (CPAR), P.O Box 30884, Lilongwe 3. Malawi

5. Experience

(a) Teaching

- since 2010 Curriculum developer and lecturer of Environmental Nanotechnology Module
Offered under the Chair of Materials Science and Nanotechnology, Institute of Material Science in Faculty of Mechanical Engineering
- since 2001 Regular resource person for the UNEP/UNESCO/BMU TU Dresden Postgraduate Courses in Environmental Management.
The main teaching activities include:
- a) Lectures and Excursion for Mining Site Restoration (which include water treatment in former uranium mining sites)
 - b) Lectures in Environmental Biotechnology for Mine Water Treatment
 - c) Lectures in Eco-technology (for remediation of radionuclides and heavy metals) in Mine Water Treatment
- 2000-2009 Involved in lecturing assignments under Chair of General Ecology in the Institute of General Ecology and Environmental Protection.
These include:
- a) Aquatic Biogeochemistry
 - b) Ecotoxicology (under bio-indication practical)
 - c) Lectures and excursion in Ecological Engineering (restoration and rehabilitation of former mining sites)
- 1999-2000
- a) Part-time lecturer in Occupational Health and Safety and Environmental Chemistry at University of Malawi
 - b) Visiting Resource Person in Environmental Education Course offered by Rhodes University/SADC REEC in South Africa

(b) Postgraduate research and thesis supervision

- Scientist: One exchange scientist for six months
- PhD research: Four candidates
- Three at Technische Universität Dresden
 - One at Technische Universität Berlin

MSc research : 13 students at TU Dresden (From 2001 – present)

- 3 Thesis in Nanobiophysics
- 2 Thesis in Nanotechnology and Molecular Bio-Engineering
- 2 Hydrosience and Engineering
- 3 Aquatic Ecotoxicology/Chemistry
- 1 Radioecology Specialisation
- 2 Environmental Management and Town Planning

(c) Research

(i) Projects

- 1996-1998 Efficiency of sewage treatment plants in protection of urban riverine ecosystem – Case study of Mudi river in Blantyre Malawi
Institute of General Ecology and Environmental Protection of Dresden University of Technology
- 1996-1998: Biogeochemical dynamics of uranium in ecosystems of natural uranium anomaly site – investigation in Kayerekera uranium deposits in northern Malawi
Partially by Federal State of Saxon, Ministry of Geology and Environment and Germany Academic Exchange Programme
- 1998-2000 Environmental Governance (Capacity building in environment Project) – development of decentralised environmental management system for Malawi
Sponsored by DANIDA (Danish International Development Agency) in conjunction with Malawi Government
- 2000-2004 Dynamics of radionuclides, heavy metals and metalloids from former ore mining
Activity Component: Environmental discharge potentials of natural and constructed wetlands for contaminated water in the uranium ore mining and processing
Subcomponents:
(1) Mechanism and application of phytoremediation of contaminated waters from abandoned and decommissioned uranium mine; and
(2) Ecotoxicology of uranium and arsenic under different milieu physicochemical conditions in surface mine waters of abandoned uranium mines
- 2004-2006: Preparedness and Response Measures to Possible use of Arsenic in Environmental Terrorism (PREMPAET) in collaboration with Russian Academy of Sciences in Saratov Russia
Project grant: NATO under Security through Science Collaborative Linkage Grant
- 2005-2006: Development of nanoscale bio-material as biocatalysts for the exhaust gas from motor vehicles engines (BIOCAD)
Project grant: Germany Federal Ministry of Education and Research (BMBF)
- 2006-2009: Nanoscale bio-composite material as biocatalysts for the treatment of MTBE/ETBE contaminated water (NANOKAT)
- 2008-2009: On-line monitoring system of arsenic and radionuclide contamination for surface and ground water in former mining sites (OMAR)
Project grant: Germany Federal Ministry of Education and Research (BMBF)
(in framework of Germany-Canada Scientific and Technology Corporation)

2006-2010: Biomineralisation processes in the sediments of "Constructed Wetland" during removal of radionuclides and heavy metals from flooded shaft of former uranium mine (COWAR)

Project grant: Germany Federal Ministry of Education and Research (BMBF)

2009-2012: Chip-based biosensor system (ChiBS)

Project grant: Germany Federal Ministry of Education and Research (BMBF)

(ii) Publications (Selected)

- Books
1. **Mkandawire, M.** (2011) *Ecowriting – Advice to ESL on Effective Scientific Writing in Environmental Sciences and Engineering*. Nova Sciences Publishers. New York. ISBN: 978-1-60876-425-9
 2. **Mkandawire, M.** (2005) *Fate and Effects of uranium and arsenic in surface mine waters of abandoned uranium mines*. Shaker-Verlag. Aachen. Germany. ISBN 3-8322-4062-4. pp 164
- peer-review journals and book chapters
1. Mkandawire M, Lakatos M, Springer A, Clemens A, Appelhans D, **Mkandawire M**, Pompe W and Rödel G (Submitted) Targeting of Au nanoparticle to mitochondria to influence apoptosis in human cancerous cells, *Small*
 2. Nganou C, and **Mkandawire M**, (In review) M A New Pathway of Excitation Energy Transfer inside the Phycobiliprotein Antenna System of *Acaryochloris marina*, *Biophysical Journal*
 3. **Mkandawire M**, Dudel EG and Teixeira da Silva JA, (In review) The *Lemna*-Test: Higher plants bioassay in environmental toxicology, *Biotechnology Advances*
 4. 1. J. Kothe, A. Schröter, K. Zarschler, D. Wersing, M. Mkandawire, K. Ostermann, W. Pompe, G. Rodel, and G. Gerlach (2012) Optical biosensor based on the dependent expression of fluorescent Proteins, *tm-Technisches Messen*, 79:60-64
 5. **Mkandawire M** and Dudel EG (2011) Homeostatic regulation of elemental stoichiometry by *Lemna gibba* L. G3 when phosphate interacts with uranium and arsenic, *Ecotoxicology*, Online, DOI: 10.1007/s10646-011-0805-z
 6. Schaller J, Brackhage C, **Mkandawire M** and Dudel EG (2011) Metal/metalloid accumulation/remobilization during aquatic litter decomposition in freshwater: a review, *Science of the Total Environment*, 409(23):4891-8.
 7. Pannier A, **Mkandawire M**, Soltmann U, Pompe W, Böttcher H (2011) Biological activity and mechanical stability of sol-gel bio-composites using freeze-gelation for immobilization of *Rhodococcus ruber*, *Applied Microbiology and Biotechnology*, DOI 10.1007/s00253-011-3489-7
 8. Schaller J, **Mkandawire M**, Dudel EG. (2010) Heavy metals and arsenic fixation into freshwater organic matter under *Gammarus pulex* L. influence. *Environmental Pollution* 158(7) 2454-2458
 9. Schaller J, Weiske A, **Mkandawire M**, Dudel EG. (2010) Invertebrates control metals and arsenic sequestration as ecosystem engineers. *Chemosphere* 79(2):169-173.
 10. **Mkandawire M** and Dudel E. Gert (2009) Uranium in the water of abandoned

uranium mines: ecotoxicology and bioremediation implications. In Gerhardt H. Wolfe (ed.) Uranium: Compounds, Isotopes and Applications. Nova Sciences Publishers, New York, ISBN: 978-1-60692-573-7

11. **Mkandawire M.**, Förster J, Fiedler D., Böttcher H and Pompe W (2009) Spectrophotometric verification of biodegradation of phenol in a flow dynamic biocers-based bioreactor system, International Journal of Environmental, Analytical Chemistry, 89(7):529 - 541
12. Schaller, J., Weiske, A., **Mkandawire, M.**, and Dudel, E.G. (2008). Enrichment of Uranium in Particulate Matter during Litter Decomposition Affected by *Gammarus pulex* L., Environmental Science & Technology 42:8721-8726
13. **Mkandawire, M.**, Dudel, E. G. (2008). Natural occurring uranium nanoparticles and the implication in bioremediation of surface mine waters. In: Merkel, B. J., Hasche-Berger, A. (Ed.), Uranium Mining and Hydrogeology, Springer Berlin Heidelberg 2008, pp. 487-494.
14. Dudel, E. G., Aretz, K., Brackhage, C., Dienemann, H., Dienemann, C., **Mkandawire, M.**, Weiske, A. (2008). Mechanisms and capacity of sun driven uranium removal in natural and nature-like constructed wetlands. In: Merkel, B. J., Hasche-Berger, A. (Ed.), Uranium Mining and Hydrogeology, Springer Berlin Heidelberg 2008, pp. 689-690.
15. **Mkandawire M** and E. Gert Dudel (2007) Are *Lemna* spp efficient phytoremediation species, Journal of Bioremediation, biodiversity and bioavailability 1(1): 56-71
16. **Mkandawire M** and E. Gert Dudel (2007) *Lemna* bioassay in environmental toxicology: applications and limitations. In Recent Research Developments in Biotechnology & Bioengineering, Research Signpost p1-36
17. **Mkandawire, M.**, Vogel K, Taubert B. and Dudel E.G. (2007) Phosphate regulates uranium (VI) toxicity to *Lemna gibba* L. G3. Environmental Toxicology 22(1):9-16
18. **Mkandawire M.**, Dudel G.E. and Müller C. (2005) Possible biomineralisation of uranium in *Lemna gibba* G3. In: Merkel J.B., and Hasche-Berger A. (eds.), Uranium in the aquatic environment Vol. IV, Springer-Verlag, Berlin.
19. **Mkandawire M.**, Taubert, B. and Dudel EG. (2006) Limitations of growth-parameters in *Lemna gibba* bioassays for arsenic and uranium under variable phosphate availability, Journal of Ecotoxicology and Environmental Safety 65:118-128
20. **Mkandawire M.**, Taubert B. and Dudel E.G. (2005) Resource manipulation in enhancing U and As attenuation with *Lemna gibba* L. (duckweed) in tailing waters, Journal of Water, Air and Pollution 165 (1-4): 83-101
21. **Mkandawire M.**, Brackhage B., Taubert B. and Dudel E.G. (2005) Semicontinuous culture system for *Lemna gibba* bioassay: Functioning and theory of operation, Applied Ecology and Environmental Research 3(1): 19-27.
22. **Mkandawire M.** and Dudel, E.G. (2005) Assignment of *Lemna gibba* L. (duckweed) bioassay for in-situ ecotoxicity assessment, Journal of Aquatic Ecology

39(2): 151-165

23. **Mkandawire M.** and Dudel E.G. (2005) Accumulation of arsenic in *Lemna gibba* L. (duckweed) in tailing waters of two abandoned uranium mines in Saxony, Germany. *Science of the Total Environment*, 336: 81– 89.
 24. Dudel GE, Brackhage C, Dienemann H, **Mkandawire M**, Weiske A (2004) Optimising natural attenuation of trace contaminants from uranium mine tailing waters by nature like constructed wetlands, In: Jarvis A.J, Dudgeon, B and Younger P.L., (eds), *Mine Water: Policy, Process and Progress*. Peer-review conference proceeding, Newcastle University Press. Vol.II pp 25-34
 25. **Mkandawire M**, Dudel E.G., Taubert B (2004) Accumulation of uranium in *Lemna gibba* L. in relation to milieu conditions of tailing waters in abandoned uranium mines in Germany, In: Jarvis A.J, Dudgeon, B and Younger P.L. (eds), *Mine Water: Policy, Process and Progress*. Peer-review conference proceeding, Newcastle University Press. Press. Vol II, pp 9-18
 26. **Mkandawire M.**, Taubert B., and Dudel E.G. (2004) Capacity of *Lemna gibba* L. (Duckweed) for Uranium and Arsenic Phytoremediation in Mine Tailing Waters. *International Journal of Phytoremediation*, 6(4):1-16.
 27. **Mkandawire M.**, Lyubun Y.V., Kosterin P.V., Dudel E.G. (2004) Toxicity of Arsenic Species to *Lemna gibba* L. and Influence of Phosphate on Arsenic Bioavailability. *Environmental Toxicology*, 19(1): 26-35.
 28. **Mkandawire M.** and Yassin B. (2004) Decentralisation of environmental management in Malawi: lessons from donor-supported projects, *Journal of Environmental Assessment Policy and Management* 6(1) 51-72
 29. **Mkandawire M.** (2002) Decentralising Environmental Management In Malawi: The Challenge Of Capacity-Building. In: *Environmental Education, Ethics & Action in Southern Africa*. In: E. van Riesburg (ed.), HSRC Publishers, Cape Town
 30. Tychinin D.N., and **Mkandawire M.** (2004) English for Ecoscience: A Miniguide for Ex-Soviet and Eastern European Contributors. *Environmental Science and Pollution Research*, 11(1): 67.
 31. **Mkandawire M.** and Dudel G. E. (2002) Uranium Attenuation from tailing waters by floating macrophyte *Lemna gibba* L. In: J. B. Merkel, Planer-Friedrich, B. and Wolkersdorfer, C. (eds.), *Uranium in the aquatic environment Vol. III*, Springer-Verlag, Berlin. pp. 623-630.
 32. **Mkandawire M.C.** (2000) Challenges to and Opportunities for Occupational Health and Safety in Malawi; *Journal of Occupational Health and Safety*; (2000) 10:60-64
- conference contributions
1. Mahipal Ganji, **Martin Mkandawire**, Steffen Howitz, Bettina Soltmann, Klaus Kuehn, Hans-Georg Braun and Wolfgang Pompe, (2011) Micro-fluidic contact Printing of *Sacchomyces cerevisiae* on transpoarent matrices for whole-cell biosensors, 2011 Saxon Biotechnology Symposium Abstract Book, Dresden p56
 2. Mahipal Ganji, Rocco Liebschnerr,, Jochen Förster, Bettina Soltmann, Klaus P. Kuehn, **Martin Mkandawire** and Wolfgang Pompe, (2011) Mikro-Contact-Printing as mittels zur Immobilisierung von eGFP-exprimierrender Hefen auf transparenten

Matrices für die Entwicklung von Biosensoren auf Chip-Basis, 7. max-Bergmann-Symposium, Dresden p41

3. J. Kothe, A. Schröter, K. Zarschler, D. Wersing, **M. Mkandawire**, G. Gerlach, G.Rödel, W. Pompe (2010) Chip-basierter Biosensor auf Basis abhängiger Expression fluoreszierender Proteine 10. 10.11.2010, Jahrestagung des AK BioMST, Skt. Augustin
4. J. Kothe, A. Schröter, K. Zarschler, D. Wersing, **M. Mkandawire**, G. Gerlach, G.Rödel, W. Pompe (2010) Chip-basierter Biosensor auf Basis abhängiger Expression fluoreszierender Proteine 16.11.2010, Max-Bergmann-Symposium, Dresden
5. J. Kothe, A. Schröter, K. Zarschler, D. Wersing, **M. Mkandawire**, G. Gerlach, G.Rödel, W. Pompe (2011) Kompakter optischer Biosensor für neue Anwendungsfelder 3.-6.4.2011, 7. Deutsches Biosensor Symposium, Bad Heiligenstadt
6. J. Kothe, A. Schröter, K. Zarschler, D. Wersing, **M. Mkandawire**, G. Gerlach, G.Rödel, W. Pompe (2011) Optical Biosensor Based on the Dependent Expression of Fluorescent Proteins 7.-9.6.2011, OPTO 2011, Nürnberg
7. J. Kothe, K. Zarschler, **M. Mkandawire**, G. Gerlach, G.Rödel (2011) System Integration of Optical Biosensors for Industrial Process Monitoring 10.-12.10.2011, Biosensing Technology, Amsterdam
8. J. Kothe, K. Zarschler, D. Wersing, **M. Mkandawire**, K. Ostermann, G. Rödel, W. Pompe, G. Gerlach (2011) Integrierter optischer Biosensor für industrielle Anwendungsfelder 5.-7.12.2011, 10. Dresdner Sensor-Symposium, Dresden
9. Kühn K., Liebschner, R., **Mkandawire, M.**, Howitz S., Groß A., Ostermann K., Rödel R. & Pompe W (2010) Patterning of cells for whole cell-biosensor using nanoplottting technology, Nanofair 2010 - 8th International Nanotechnology Symposium, International Congress Center Dresden, Germany July 6 - 7, 2010
10. **Mkandawire M.**, Küchler A., Förster J., Pieplow G., Pompe W. (2009) Dynamics of Arsenic in Constructed Wetland Treating Water from Flooding Shaft of an Abandoned Uranium Mine. – In: Proceedings International Mine Water Conference. – p. 539.
11. Dudel, G. E., Aretz, K., Kretzschmar, J., **Mkandawire, M.** Weiske, A., Zander, K. (2009) Direct and indirect immobilisation and speciation change of soluble Uranium by algae and aquatic macrophytes, In Proceeding for OSLO Aquatic Science Meeting, Nice France 25-27 Jan. 2009
12. Schaller J., Weiske A., **Mkandawire, M.** and Dudel E.G. (2009) Invertebrate shredders enforce heavy metal enrichment in particulate organic matter, In Proceeding for OSLO Aquatic Science Meeting, Nice France 25-27 Jan. 2009 p 70-71
13. **Mkandawire, M.** Farag N., Bobeth M., and Pompe W. (2008) Mechanical stability of biocers packaged in bioreactors for fluid dynamic system. Conference abstract book of 4th Max-Bergmann-Symposium: Molecular Designed Coating, Dresden 04-

14. **Mkandawire, M.**, Dudel, E. G. (2008). Speciation dynamics of arsenic in water originating from springs on a heap tailing of abandoned uranium mining. Rapantova, N., Hrkal, Z. (eds.), Proceedings of the 10th International Mine Water Association Congress, Mine Water and the Environment, June 2-5 2008, Karlovy Vary, Esmedia DTP, ISBN 978-80-248-1767-5, 213-216
15. Aretz, K., Zander, K., **Mkandawire, M.**, Dudel, E. G. (2008). Multi-directional effect of Ca on U sorption and overall accumulation in *Myriophyllum spicatum* L., Abstractband des GfÖ-/ DGL-Workshops, Tharandt, 31.03.-02.04.2008, p. 55-56.
16. **Mkandawire, M.**, Dudel, E. G. (2008). Interplay of resource stoichiometry and homeostasis in heavy metal uptake by aquatic macrophytes: the *Lemna* sp paradigm. Abstractband des GfÖ-/ DGL-Workshops, Tharandt, 31.03.-02.04.2008, S. 27-28.
17. Dudel, E.G., Aretz, K., Brackhage, C., Dienemann, H., **Mkandawire, M.**, Ross, H., Feibicke, M., Weiske, A. (2007). Vascular plant based and microphytic accelerated trace element removal in (constructed) wetlands. 2nd Annual Meeting of the Society of Wetland Scientists – Europe. Třeboň, Czech Republic, May 30 – June 3, 2007. Book of abstracts, pp. 48-51.
18. Dudel, E.G., Aretz, K., Dienemann, C., **Mkandawire, M.**, Weiske, A., Dienemann, H., Brackhage, C. (2007). Significance of Biomass Quality and Plant Surface for Metal and Metalloid Immobilisation in Wetlands. Proceedings of the 2nd International Symposium on Wetland Pollutant Dynamics and Control. Publicationes Instituti geographici Universitatis Tartuensis 104, 87-90.
19. Dudel, E.G., Dienemann, H., Feibicke, M., **Mkandawire, M.**, Ottenstoer, T., Ross, H., Vogel, K., Weiske, A. (2007). Photosynthetic C assimilation, sedimentation, and C accumulation in sediments are main drivers of uranium immobilisation. ASLO 2007 Aquatic Sciences Meeting, February 4-9, 2007, Santa Fe, New Mexico, USA, Book of abstracts, p. 47.
20. **Mkandawire M.**, Pompe W and Dudel E.G. (2006) Prediction of uranium (VI) toxicity to *Lemna gibba* L. G3 using ion characteristics, DGL Conference Proceedings, 21-24 September 2006 Dresden
21. Vogel K, Lyubun YV, Chernyshova MP, **Mkandawire M**, Fedorov EE and Dudel GE (2006) Manifold arsenic III resistant microflora from *Myriophyllum verticilliatum* L. FEMS (the Federation of European Microbiological Societies) 2nd Congress of European Microbiologists, 4th - 8th July 2006, Madrid. Spain
22. Vogel K, Lyubun YV, Chernyshova MP, **Mkandawire M**, Fedorov EE and Dudel GE (2006) Arsenic resistant microflora associated with *Lemna* sp. in abandoned uranium mine in eastern Germany GfÖ Tagung Band, July 2006 Bremen
23. Vogel, K., **Mkandawire, M.**, Aretz, R. and Dudel, E.G. (2005) Preliminary results from software developed for complex growth models applied on *Lemna* sp. 35th Annual Conference of the Ecological Society of Germany, Switzerland and Austria (GfÖ), 19th to 23rd September 2005, Regensburg, Germany.

24. **Mkandawire, M** and Dudel E.G. (2005) Capacity and limitations of *Lemna* sp. for uranium and arsenic toxicity assessment. SETAC EUROPE 15th Annual Meeting: 22nd-26th May 2005. Lille, France
25. Dudel, G.E. ; Feibicke, M., **Mkandawire, M.**, Ottenströer, T., Ross, J-H., Vogel, K., Weiske, A., (2005) Primary production and sedimentation form a continuous uranium sink regard-less of chemical speciation changes, in OSLO Conference Proceedings (2005) A Pilgrimage Through Global Aquatic Sciences, 19-24 June, 2005 · Santiago de Compostela, Spain
26. Feibicke, M, Ross, J.-H., Weiske, A., Vogel, K., **Mkandawire, M**, Ottenströer T, and Dudel, E.G. (2005) Fate of Uranium in an aquatic stream mesocosm. SETAC EUROPE 15th Annual Meeting: 22nd-26th May 2005. Lille, France
27. Dudel E. G., Brackhage C., Clemens C., Dienemann H., **Mkandawire M.** and Weiske A. (2004) Uranium mine and tailing water treatment in multistage wetlands for overcoming the basic limitations conventional approaches. Deutsch-Amerikanische Umweltkonferenz. Görlitz Sächs. Landesstiftung, Sächs. Staatsmin. Umwelt u. Landwirtsch.
28. Dudel E.G., **Mkandawire M.**, Vogel K. and Weiske A. (2004) Efficiency and regulation of uranium and arsenic elimination from the water pathway by selected aquatic communities. Conference Abstracts, 7th Intecol International Wetlands Conference Utrecht, p. 90, www.bio.uu.nl/intecol
29. **Mkandawire M.**, Taubert B. and Dudel E.G. (2003), Effects of phosphate and ammonium amendments on arsenic and uranium immobilisation by *Lemna* sp. from tailing waters, In: Kalogerakis, N. 2nd European Remediation Conference, Chania Kreta Greece. pp 405-408
30. **Mkandawire M.**, Taubert B. and Dudel E.G. (2003), Biosorption capacity and limits in uranium immobilisation by dead and living *Lemna gibba* L. biomass, In: Kalogerakis 2nd European Remediation Conference, Chania Kreta Greece. pp 357-360
31. **Mkandawire M.**, Taubert B. and Dudel E.G. (2003), Potential of *Lemna* sp. for phytoremediation of uranium and arsenic from mine tailing waters, In: Turkovskaya O.V. and Ignatov V.V. (eds) International Symposium Biochemical Interactions of Microorganisms and Plants with Technogenic Environmental Pollutants (Saratov, 28–30 July 2003) p56-57
32. Dudel G.E., **Mkandawire M.**, Dienemann C. and Taubert B (2003) Interaction of nutrient and pollutants (P, As, U) in ecotoxicological test and in the field influence by bioavailability to growth rate and biomass. Conference Proceedings of Ecotoxicology and Ecosystems: Relevance, Restrictions, Research Needs, Bredbeck (Bremen, Germany), March 19-21, 2003
33. Dudel E.G. and **Mkandawire M.** (2003) Mechanisms of uranium attenuation from tailing waters by floating macrophyte *Lemna gibba* L. The 25 Anniversary of UNEP/UNESCO/BMU Postgraduate Environmental Management Course Seminar, TU Dresden

34. Dudel G. E., Brackhage C., Dienemann C., Dienemann H., **Mkandawire M.**, Rotsche J. and Weiske A. (2002) Natural attenuation of radionuclides and arsenic in selected aquatic communities – based to construct multistage wetlands. Proceeding 1st ASEM Conference on Bioremediation, September 24-27 2002 Hanoi Vietnam
35. Dudel, G. E., Brackhage, C., **Mkandawire, M.** and Clemens, C. (2002) Do hyperaccumulator plants of heavy metals really exist? In Landschaft in Wandel - Ökologie in Wandel (Changing landscapes-changing ecology) In: Peschel T., Mrzljak, J. and Wiegler, G. (eds.), Vol. 32. Gesellschaft für Ökologie, Berlin, Cottbus, Germany.
36. **Mkandawire, M.**, Dudel, E.G. and B. Merkel (2002) Mechanisms of phytoremediation of radionuclides contamination from former uranium mining site: Proceeding of Biotechnology Conference, Berlin
37. Dudel, E.G., Brackhage, C., Dienemann, H., **Mkandawire, M.**, Rotsche, J. and A.Weiske (2001) Principles and limitations for natural attenuation of radionuclides in former uranium mining and milling sites, Proceedings of the 8th Int. Conference of Radioactive Waste and Environmental Management, Am. Soc. of Mech. Engineers. & US Dept. of Energy (2001). p 8.
38. **Mkandawire, M.** and Dudel E.G. (1998) Limits of high sewage treatment technology in moderate tropical climate: a case of City of Blantyre in Malawi, southeast Africa. Proceedings of VII International Congress of Ecology (INTECOL), Florence, Italy, July 19-25, 1998.

6. Other information

(a) Personal achievement

1. Establishment of Environmental Nanotechnology Research Group and development of the Environmental Nanotechnology Course
2. Establishment of successful Geochemistry Research Component in research focus of remediation former uranium mining sites in Institute of General Ecology and Environmental Protection of TU Dresden
3. More than 1 Million Euros in extramural research funding

(b) Professional Membership

- Member
- American Chemical Society
 - DECHEMA (Society for Chemical Engineering and Biotechnology)
 - International Mine Water Association (IMWA)
 - Deutscher Hochschulverband (DHV)
 - Environmental Education Association of Southern Africa (EEASA)

(c) Professional contributions and activities

- Journal editor
- Editor of International Journal of Materials and Chemistry
 - Editorial Board member of Biologia (section Cellular and Molecular Biology)

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| journal | • Nature Methods |
| peer reviewing | • Journal of Hazardous Materials (http://ees.elsevier.com/hazmat) |
| | • Journal of Environmental Management (http://ees.elsevier.com/jema/) |
| | • Chemical Engineering Journal (http://ees.elsevier.com/cej/) |
| | • Chemosphere (http://ees.elsevier.com/chem/) |
| | • Science of the Total Environment (http://ees.elsevier.com/stoten/) |
| | • Experimental and Environmental Botany (http://ees.elsevier.com/eeb/) |
| | • Pedosphere (http://www.sciencedirect.com/science/journal/10020160) |
| | • Ecotoxicology and Environmental Safety
(http://www.sciencedirect.com/science/journal/01476513) |
| | • Chemistry and Ecology http://www.tandf.co.uk/journals/titles/02757540.html |
| | • Plant and Soil Journal http://www.editorialmanager.com/plso/ |
| | • Environmental Science and Pollution Research
(http://www.springerlink.com/content/112851/) |
| project evaluation | 1. The Academy of Sciences of the Czech Republic (http://www.cas.cz/) |
| & reviewing | 2. National Research Foundation (NRF) of South Africa (http://www.nrf.ac.za) |
| | 3. International Expert for National Academy of Sciences of the Republic of Kazakhstan |
| External | 1. Faculty of Chemistry, University of Witwatersrand |
| Examiner for PhD | 2. Faculty of Physics, Technische University Berlin, Germany |

(d) Technical skills

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| computer: | • Good knowledge of Windows and Solaris environment |
| | • Matlab, Mathematica, SPSS, PhreeqC, Xact, Chemdraw, Comsol etc |
| | • Graphic design and geometrical drawings |
| microscopy: | • AFM/EFM, SEM-EDX, Fluorescence Microscopy Techniques, TEM (basic); Laser Confocal Microscopy |
| analytics: | • UV-vis spectroscopy |
| | • ICP-MS, ICP-OES, AAS, Gamma Spectroscopy, Ion, Gas and liquid Chromatography |
| | • NMR (basic) and IR (basic) |
| | • X-ray diffraction; XPS |
| | • Raman Spectroscopy |
| bio/geo/chemical | • Micro-contact printing technology of microorganism and biomolecules |
| procedures: | • Nanoplotting technology |
| | • Chemical synthesis and catalysis |
| | • Surface chemistry procedure |
| | • Gel electrophoresis, PCR and Real Time PCR (RT-PCR) |
| | • Toxicological bioassay |
| | • Cell staining and handling of different cells |
| | • Preparation of biological samples for TEM (Critical Point drying) |

- Ultrafiltration and sequential extraction procedures
- Cell culture techniques
- material science:
 - Biofunctionalisation of Si-based materials
 - Sol-gel technology
 - Mechanical stability testing
 - Characterisation of material surface and determination of porosity
 - Finite element analysis (basics)
- communication
 - Scientific communication and writing
 - Critical analysis
 - Project conceptions and proposal writing and searching for funding

(e) Language proficiency

	Speaking	Writing	Reading
English:	Native	Excellent	Excellent
German:	Excellent	Excellent	Excellent

(f) Extra curricula

- hobby journalism:
 - radio programme production, moderation and presentation on local FM radio
- hobby research:
 - scientific communication and writing (presentations and publications)
 - development policy (presentations and publications)
- sport:
 - Squash, Karat and Body building
- art:
 - Poetry and playwright, line drawing, painting and graphic designing

6. Referees

1. Prof. Dr. habil Wolfgang Pompe

Institute of Materials Science
 Technische Universität Dresden
 01062 Dresden. Germany
 E-mail: wolfgang.pompe@nano.tu-dresden.de

3. Prof. Dr. Gianarelio Cuniberti

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 Technische Universität Dresden
 01062 Dresden. Germany
 E-mail: gianarelio.cuniberti@nano.tu-dresden.de

2. Prof. Dr. habil E. Gert Dudel

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 Protection,
 Technische Universität Dresden
 01062 Dresden. Germany
 E-mail: gert.dudel@tu-dresden.de

4. Prof. Dr. Jerome Nriagu

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Dresden, 13 February 2012



(PD Dr. Martin Mkandawire)

