

Curriculum vitae:

Toma Toncian (born on 16. Juni 1980 in Cluj-Napoca, Romania)

Institut für Laser - und Plasmaphysik

Heinrich-Heine Universität Düsseldorf

40225-Düsseldorf, Germany

email: toma.toncian@uni-duesseldorf.de, Tel. +49(0211)-81-13725, Fax. -13718

Education: *1999*: high school diploma at National College G. Cosbuc Cluj-Napoca, RO
 2004: Diploma Physics "with distinction", diploma thesis: "Quantitative measurements of electrical fields in laser generated plasmas", Univ. Düsseldorf, Germany
 2008: Dr. rer. nat., PhD. in physics with "summa cum laude", title "Ultrafast laser-driven micro-lens for focussing and energy selection of MeV protons", Univ. Düsseldorf, Germany under the supervision of Prof. O. Willi, Prof. K.H. Spatschek

Profession: *2008*: postdoctoral fellow, Institute for Laser and Plasma Physics Univ. Düsseldorf
 2010: akademischer Rat., Univ. Düsseldorf
 since Nov 2010 also at Ion Beam Application Group Essen

Research fields: relativistic laser matter interaction, Multi MeV laser accelerated electrons and ions, VUV, XUV and X-Ray sources, development of the 100 TW + 200 TW laser facility ARCTURUS

Awards:

1999-2004: fellow of Gemeinnützigen-Hermann-Niermann foundation Düsseldorf, scholarship for the study of physics

2004-2008: fellow of the Deutsche Forschungsgemeinschaft SFB TransRegio 18 and Research Training Group 1203

2005: 1st Prize for patents in North-Rhine Westfalia

Present memberships:

Fellow of the DPG, Germany

Scientific publications in peer reviewed journals:

39 total since 2004. Selected 20 important publications are: **Science** **312**, 410 (2006), **Nature Physics** **1** 48-54 (2006), **Physical Review Letters** **105** 015005 (2010), **103** 135003 (2009), **102** 194801 (2009), **101** 105004 (2008), **101** 025004 (2008), **100** 245001 (2008), **99** 015002 (2007), **95** 195001 (2005), **105** 015005 (2010), **Review of Scientific Instruments** **80** 113506 (2009), **10** 3531-3536 (2004), **Laser Particle Beams** **26** 241-248 (2010), **25** 71-77 (2007), **25** 161-167 (2007), **23** 291-295 (2005), **Physics of Plasmas** **14** 030701 (2007)

10-year Track Record:

1. Top 10 publications over the last 10 years

1. T. Toncian, M. Borghesi, J. Fuchs, Emmanuel d'Humieres, P. Antici, P. Audebert, E. Brambrink, C. A. Cecchetti, A. Pipahl, L. Romagnani and Oswald Willi, *Ultrafast laser driven micro-lens to focus MeV proton*, Science **312**, 410 (2006)
2. T. Toncian, M. Swantusch, M. Toncian, O. Willi, A. A. Andreev, K. Platonov, *Optimal proton acceleration from lateral limited foil sections and different laser pulse durations at relativistic intensity*, Phys. Plas. to be published 04.2011
3. J. Fuchs, P. Antici, E. d'Humieres, E. Lefebvre, M. Borghesi, E. Brambrink, C. A. Cecchetti, M. Kaluza, V. Malka, M. Manclossi, S. Meyroneinc, P. Mora, J. Schreiber, T. Toncian, H. Pepin, and R. Audebert, *Laser-driven proton scaling laws and new paths towards energy increase*, Nature Physics, **2** 4854, 2006.
4. M. Cerchez, R. Jung, J. Osterholz, T. Toncian, O. Willi, P. Mulser and H. Ruhl, *Absorption of ultra-short laser pulses in strongly over-dense targets*, Phys. Rev. Lett. **100**, 245001 (2008)
5. P. Antici, J. Fuchs, M. Borghesi, L. Gremillet, T. Grismayer, Y. Sentoku, E. d'Humieres, C. A. Cecchetti, A. Mancic, A. C. Pipahl, T. Toncian, O. Willi, P. Mora, and P. Audebert, *Hot and cold electron dynamics following high-intensity laser matter interaction*, Phys. Rev. Lett., **101** 105004 (2008)
6. L. Romagnani, S. V. Bulanov, M. Borghesi, P. Audebert, J. C. Gauthier, K. Löwenbrück, A. J. Mackinnon, P. Patel, G. Pretzler, T. Toncian, O. Willi, *Observation of collisionless shocks in laser-plasma experiments*, Phys. Rev. Lett. **101**, 025004 (2008)
7. T. Sokollik, M. Schnuerer, S. Steinke, P.V. Nickles, W. Sandner, M. Amin, T. Toncian, O. Willi, A.A. Andreev, *Directional laser-driven ion acceleration from microspheres*, Phys. Rev. Lett. **103**, 135003 (2009)
8. K. Quinn, P. A. Wilson, C. A. Cecchetti, B. Ramakrishna, L. Romagnani, G. Sarri, L. Lancia, J. Fuchs, A. Pipahl, T. Toncian, O. Willi, R. J. Clarke, D. Neely, M. Notley, P. Gallegos, D. C. Carroll, M. N. Quinn, X. H. Yuan, P. McKenna, T. V. Liseykina, A. Macchi, and M. Borghesi, *Laser-driven ultrafast field propagation on solid surfaces*, Phys. Rev. Lett., **102** 194801 (2009)
9. L. Romagnani, J. Fuchs, M. Borghesi, P. Antici, P. Audebert, F. Ceccherini, T. Cowan, T. Grismayer, S. Kar, A. Macchi, P. Mora, G. Pretzler, A. Schiavi, T. Toncian, and O. Willi, *Dynamics of electric fields driving the laser acceleration of multi-mev protons*, Phys. Rev. Lett., **95** 195001, 2005
10. T. Sokollik, M. Schnurer, S. Ter-Avetisyan, P. V. Nickles, E. Risse, M. Kalashnikov, W. Sandner, G. Priebe, M. Amin, T. Toncian, O. Willi, and A. A. Andreev, *Transient electric fields in laser plasmas observed by proton streak deflectometry*. Applied Physics Letters, **92** 2008

2. Granted patents

- O. Willi, T. Toncian, M. Borghesi and J. Fuchs, *PILZ* Deutsche Patentanmeldung 10 2005 012 059.8 (2005); also filed in the EU, US and Japan under CNRS L07216 US Patent

3. Presentations at international conferences during the last five years

1. 11th International Workshop on Fast Ignition of Fusion Targets, October 2010, Shanghai, China
2. 11th International Conference "Laser Optics 2010", June 2010 St. Petersburg, Russia (invited)
3. Light at Extreme Intensities, October 2009, Brasov, Romania(invited)

4. International Symposium on Laser-Driven Relativistic Plasmas Applied for Science, Industry and Medicine Kansai Photon Science Institute, Sept. 2007, Nara, Japan (invited)
5. ILIAS GSI, July 2007, Darmstadt, Germany (invited)
6. Symposium on Relativistic Laser Plasma Interaction, March 2007, Düsseldorf, Germany (invited)
7. Heraeus Seminar Laser Particle Acceleration, February 2007, Bad Honnef, Germany
8. Christmas Meeting of the High Power Laser Science Community, Dec. 2006, Abingdon, UK
9. 33 EPS Conference on Plasma Physics, June 2006, Roma, Italy
10. 26 International Workshop on High Energy Density in Matter, January 2006, Hirschegg, Austria

4. Research expeditions

The applicant took part of the experiments during the following laser beam times:

- *Quantitative measurements of electric fields on the rear side of high intensity laser irradiated targets*, 100 TW, LULI (2002)
- *Proton focusing in a laser irradiated hollow metal cylinder*, VULCAN laser system, RAL, (2006)
- *Proton focusing in a laser irradiated hollow metal cylinder*, 100 TW, LULI (2006)
- *Production of mono-energetic ion beams using targets consisting of small micro-dots*, 100 TW, LULI (2008)
- *Influence of overlapping high-intensity laser beams on electron and ion generation and transport*, VULCAN laser system, RAL, (2009)
- *Enhanced laser ion acceleration from thin and reduced mass targets*, 100 TW, LULI (2009)
- *Energy loss of ions in moderate to strongly coupled plasmas*, 100 TW, LULI (2011)