

Curriculum vitae

- **Dr. Sc. Ticijana Ban**



Personal data:

First name: Ticijana

Last name: Ban, born Jurman

Date of birth: 15.10.1972.

Place of birth: Pula, Croatia

Married since January 29, 1994 with Orijano Ban

One son, Loren Ban (born 1994)

Private address: Ul. Grada Chicaga 23, 10 000 Zagreb

Position:

Senior Research Associate at Institute of Physics, P. O. Box 304, HR-10 000 Zagreb, Croatia

Phone: +385 1 4698 865

Fax: +385 1 4698 889

e-mail: ticijana@ifs.hr, web-site: <http://projekt2.ifs.hr/ban/ban.htm>

Education:

- 1979-1987 Elementary school: Pula, Croatia
- 1987-1991 Secondary school (mathematics and informatics): Pula, Croatia
- 1991- 1997 The Faculty of Mathematical and Natural Sciences, Physics Department University of Zagreb:

Diploma work (B. Sc) in July 1997: *Atomic and Molecular Spectroscopy of the Lithium Vapor*, supervisor Dr.Sc. Goran Pichler

Master thesis (M.Sc.) on atomic and molecular physics at the University of Zagreb in March 2000: *Photoassociation of Cesium Atoms*, supervisor Dr.Sc. Goran Pichler

PhD thesis (Dr.Sc.) on atomic and molecular physics at the University of Zagreb in January 2003: *Photoassociation and Photodissociation of Alkali Molecules*, supervisor Dr.Sc. Goran Pichler

Profession:

Employed at the Institute of Physics in Zagreb since February 1998. in the group of Dr.Sc. Goran Pichler. Currently working as a Senior Research Associate under the national project "Femtosecond laser physics of atoms and molecules", main researcher Dr. Pichler.

Professional career:

- 1998-2000, Junior Scientific Assistant (PhD student, B.Sc. degree)
- 2000-2003, Scientific Assistant (PhD student, M.Sc. degree)
- 2003-2004, Senior Scientific Assistant (post-doc, Dr.Sc. degree)
- 2004-2007, Research Associate (permanent position)
- 2007- , Senior Research Associate (permanent position)

Scientific Accomplishments:

- Co-authored 27 original scientific articles in well known international physics journals
- Attended 14 international conferences (2 invited talks + 5 oral contributions + 7 poster contributions)
- Possessed six invited seminars at different scientific institutions
- Mentor of one diploma work (G. Školnik, Physics Department University of Zagreb, February 2008.)
- Actively participated in the foundation of the Laboratory for Femtosecond Laser Spectroscopy at the Institute of Physics (<http://projekt2.ifs.hr/femto-laboratorij.htm>)

Areas of Specialization:

- **Experimental** (white-light absorption spectroscopy, laser absorption spectroscopy, diode lasers, femtosecond lasers, optical frequency comb spectroscopy)
- **Analytical** (mathematical analysis and statistics, numerical computation)
- **Computer** (Windows OS, MS Office, Origin, Matlab, Mathcad, Labview, Fortran)

Fields of work in the past:

- Diode laser spectroscopy of alkali vapors. Glow discharges in alkali vapors in heat-pipe oven. Absorption measurement in alkali vapor by using all sapphire cells (satellite bands, photoassociation, long range molecule). Semiclassical and quantum mechanical calculations of alkali diffuse and satellite bands. Photoassociation of Rb atoms at thermal energies, dissociation of rubidium molecules, optical pumping of the Zeeman sublevels of rubidium hyperfine states.

Fields of present and future interest:

- Coherent interaction of atomic systems with long trains of femtosecond laser pulses. Frequency comb spectroscopy. Application of the fs lasers to the generation of cold alkali cloud.

Participation in national scientific projects:

- Laser guiding and diagnostics of processes in vapours and plasmas, main researcher Dr.Sc. G. Pichler (1998-2000)
- Femtosecond laser spectroscopy and Ultracold Molecules, main researcher Dr.Sc. G. Pichler (2000-2005)
- Femtosecond laser physics of atoms and molecules, main researcher Dr.Sc. G. Pichler (2006-)

Participation in international scientific projects:

- Bilateral project Austria-Croatia, project leader Dr.Sc. T. Ban – Dr.Sc. L. Windholz - Technische Universität Graz
- Cold Molecules: Formation, Trapping and Dynamics Research Training Network, FW5, EU
- Femtosecond Laser Effects on Organic Light Emitting Devices Bilateral project France-Croatia, Dr.Sc. – Dr.Sc. Marie-Claude Castex (Laboratoire des Physiques des Lasers, CNRS, Université Paris-Nord (Paris 13), Villetaneuse, France)
- Ultrafast Laser Cooling of Molecules and Biomolecules Bilateral project Germany-Croatia, Dr.Sc. G. Pichler – Dr.Sc. E. Riedle (LMU München, Germany)

Research visits:

- Institute of Spectrochemistry and Applied Spectroscopy (ISAS), Dortmund, Germany (June and July 2001. and 2004.) – femtosecond laser ablation
- Istituto per i processi chimico-fisici (IPCF) Pisa, Italy, (16.6.-12.7.) 2003. – ultracold molecules
- European Laboratory for Non-Linear Spectroscopy (LENs), Firenze, Italy (14.7-5.9.) 2003., July 2005. – Bose-Fermi mixtures

Teaching experience:

- Education in physical practica for students of physics and chemistry at the Faculty of Mathematical and Natural Sciences, Physics Department University of Zagreb.

Knowledge of foreign languages:

- English, reading and speaking, actively
- Italian, reading and speaking, actively
- German, beginner

Publications:

1. T. Ban, D. Aumiler, H. Skenderović, S. Vdović, N. Vujičić and G. Pichler: Cancellation of the coherent accumulation in rubidium atoms excited by a train of femtosecond pulses, *Phys. Rev. A* **76**, 043410 (2007).
2. S. Vdović, T. Ban, D. Aumiler and G. Pichler: EIT at $5^2S_{1/2} \rightarrow 6^2P_{3/2}$ transition in a mismatched V-type rubidium system, *Opt. Commun.* **272**, 407 (2007).
3. N. Vujičić, S. Vdović, D. Aumiler, T. Ban, H. Skenderović and G. Pichler: Femtosecond laser pulse train effect on Doppler profile of cesium resonance lines, *Eur. Phys. J. D* **41**, 447 (2006).
4. R. Beuc, M. Movre, T. Ban, G. Pichler, M. Aymar, O. Dulieu and W. Ernst: Predictions for the observation of KRb spectra under cold conditions, *J. Phys. B: At. Mol. Opt. Phys.* **39**, S1191 (2006).
5. T. Ban, D. Aumiler, H. Skenderović and G. Pichler: Mapping of the optical frequency comb to the atom-velocity comb, *Phys. Rev. A* **73**, 043407 (2006).
6. N. Vujičić, H. Skenderović, T. Ban, D. Aumiler, G. Pichler: Low-density plasma channels generated by the femtosecond pulses, *Appl. Phys. B* **82**, 377 (2006).
7. D. Aumiler, T. Ban, H. Skenderović, G. Pichler: Velocity selective optical pumping of Rb hyperfine lines induced by a train of femtosecond pulses, *Phys. Rev. Lett.* **95**, 233001 (2005).
8. S. Vdović, R. Beuc, D. Aumiler, T. Ban, G. Pichler: Absorption spectrum of Na-K-He mixture: experiment and theory, *J. Phys. B: At. Mol. Opt. Phys.* **38**, 3107 (2005).
9. D. Aumiler, T. Ban, G. Pichler: Femtosecond laser-induced cone emission in dense cesium vapour, *Phys. Rev. A* **71**, 063803 (2005).
10. T. Ban, D. Aumiler, G. Pichler: Rubidium dimer destruction by a diode laser, *Phys. Rev. A* **71**, 022711 (2005).
11. D. Aumiler, T. Ban, G. Pichler: High-resolution measurements of the pressure broadening and shift of the rubidium $5S_{1/2}-6P_{3/2}$ line by argon and helium, *Phys. Rev. A* **70**, 032723 (2004).
12. T. Ban, D. Aumiler, R. Beuc, G. Pichler: Rb₂ diffuse band emission excited by diode lasers *Eur. Phys. J. D* **30**, 57 (2004).
13. T. Ban, R. Beuc, H. Skenderović, G. Pichler: Rubidium pure long-range ion-pair molecules *Europhys. Lett.* **66**, 485 (2004).
14. V. Margetić, T. Ban, O. Šamek, F. Leis, K. Niemax, R. Hergenroder: Shock-wave velocity of a femtosecond-laser-produced plasma, *Czechoslovak Journal of Physics* **54**, 5493C (2004).

15. A. Fioretti, M. Fazzi, M. Mazzoni, T. Ban, C. Gabbanini: Ultra-Cold Molecules, *Physica Scripta* T112, 13 (2004)
16. D. Aumiler, T. Ban, R. Beuc, G. Pichler: Simultaneous temperature and density determination of rubidium vapour, *Appl. Phys. B* **76**, 859 (2003).
17. V. Margetić, T. Ban, F. Leis, K. Niemax, R. Hergenröder: Hydrodynamic expansion of a femtosecond laser produced plasma, *Spectrochimica Acta B* **58**, 415 (2003).
18. G. Pichler, V. Živčec, R. Beuc, Z. Mrzljak, T. Ban, H. Skenderović, K. Günther, J. Liu: UV, Visible and IR Spectrum of the Cs High Pressure Lamp *Physica Scripta* Vol. TXX, 1 (2003).
19. H. Skenderović, R. Beuc, T. Ban, G. Pichler: Blue Satellite Bands of KRb Molecule, Intermediate Long-Range States, *Eur. Phys. J. D* **19**, 49 (2002).
20. T. Ban, H. Skenderović, R. Beuc, I. Krajcar Bronić, S. Rousseau, A.R. Allouche, M. Aubert-Frécon, G. Pichler: Pure long-range ion-pair Cs₂ molecules, *Chem. Phys. Lett.* **345**, 423 (2001).
21. R. Beuc, H. Skenderović, T. Ban, D. Veža, G. Pichler, W. Meyer: Cesium satellite band at 875.2 nm stemming from the Cs₂ 0g+ (6p 2P_{1/2}+6s 2S_{1/2}) state, *Eur. Phys. J. D* **15**, 209 (2001).
22. T. Ban, H. Skenderović, S. Ter-Avetisyan, G. Pichler: Absorption measurements in dense cesium vapor using UV-violet light emitting diode, *App. Phys. B* **72**, 337 (2001).
23. H. Skenderović, T. Ban, G. Pichler: LiH emission spectrum from the glow discharge in the heat-pipe oven, *J. Phys. D: Applied Physics* **33**, 396 (2000).
24. T. Ban, H. Skenderović, R. Beuc, G. Pichler: Photoassociation of cesium atoms into Cs₂ 3 3Pg state at 543.5 nm, *Europhys. Lett.* **48**, 378 (1999).
25. T. Ban, S. Ter-Avetisyan, R. Beuc, H. Skenderović, G. Pichler: Photoassociation of cesium atoms into the double minimum Cs₂ 3 1S+u state, *Chem. Phys. Lett.* **313**, 110 (1999).
26. H. Skenderović, T. Ban, G. Pichler: Constriction in lithium glow discharge in a heat-pipe oven *Optics Comm.* 161, 217 (1999).
27. T. Ban, H. Skenderović, B. Resan, G. Pichler: Laser induced fluorescence of Li₂ A 1Su+ state *Fizika A* **6**, 161 (1997).

Seminars at scientific institutions:

- T. Ban, Manipulation of the atom velocity using femtosecond lasers, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, 07.03.2007.
- T. Ban, Mapping of the frequency comb to the atom-velocity comb, Faculty of Mathematical and Natural Sciences, Physics Department University of Zagreb, Croatia, 14.11.2006.
- T. Ban, Mapping of the optical frequency comb to the atom velocity comb Institut Galilée, Université Paris-Nord (Paris 13), Villetaneuse, France, 06.10.2006.
- T. Ban, BEC-the experimental view Institut of physics, Zagreb, Croatia, 29.04.2004.
- T. Ban, Pure long-range ion-pair alkali molecules, Istituto per i processi chimico-fisici (IPCF), Pisa, Italy, 2003.
- T. Ban, Velocity selective optical pumping of Rb lines induced by a train of femtosecond pulses, European Laboratory for Non-Linear Spectroscopy (LENs), Florence, Italy, 2005.

Workshops and conferences:

Invited talks

- Ticijana Ban, Femtosecond lasers – accuracy in frequency and time, 5th Meeting of the Croatian Physical Society, 5.-8. 10. 2007. Primošten, Croatia.
- Ticijana Ban, Femtosecond pulse train excitation of a Doppler broadened rubidium vapor From Solid State to BioPhysics III, 24.06.-01.07. 2006. Dubrovnik, Croatia.

Oral contributions

- Ticijana Ban, Manipulation of the atom velocity with femtosecond laser frequency comb, Imaging in Space and Time, 28.08.-01.09. 2006. Brijuni, Croatia.
- T. Ban, D. Aumiler, H. Skenderović and G. Pichler: Mapping of the optical frequency comb to the atom velocity comb, 15th International Conference on Ultrafast Phenomena, 31.07.-04.08. 2006. Pacific Grove, California, USA.
- Ticijana Ban, Velocity selective optical pumping of Rb hyperfine lines induced by a train of femtosecond pulses, Laser Control and Molecular Switches, 28.08.-02.09. 2005. Brijuni, Croatia.
- T. Ban, D. Aumiler, H. Skenderović, G. Pichler: Coherent accumulation induced velocity selective optical pumping of Rb hyperfine lines, 37th EGAS Conference: European Physical Society, (2005), Dublin, Ireland.
- T. Ban, D. Aumiler, G. Pichler: Optical pumping of the Zeeman sublevels of rubidium hyperfine states, 34th EGAS Conference: European Physical Society, (2002), Sofia, Bulgaria.

Poster contributions:

- T. Ban, D. Aumiler, H. Skenderović, G. Pichler: Femtosecond pulse train excitation of a Doppler broadened rubidium vapor, 38th EGAS, (2006), Napulj, Italy.
- T. Ban, D. Aumiler, H. Skenderović, G. Pichler: Coherent accumulation in rubidium atoms excited by a train of femtosecond pulses, Symposium on "Advanced Laser Applications", (2005), Dresden, Germany
- T. Ban, D. Aumiler, G. Pichler: Backward fluorescence from dense cesium vapor induced by Ti:Sa femtosecond laser, Matter under extreme conditions (NATO ARW), (2004), Brijuni, Croatia.
- T. Ban, R. Beuc, H. Skenderović, G. Pichler: High excited ion-pair long-range alkali molecules, Coherent Control and Cold Molecules, (2001), Gif-sur-Yvette, France.
- T. Ban, H. Skenderović, R. Beuc, G. Pichler: Ion-pair satellite bands in heavy alkali dimers: ultracold ion-pair molecule, The Brijuni Conference VII, 2000, Brijuni, Croatia.
- T. Ban, H. Skenderović, I. Krajcar, R. Beuc, G. Pichler: Strange long-range satellite bands in the blue wing of Cs 455 nm line, 15th International Conference on Spectral Line Shapes, (2000), Berlin, Germany.
- T. Ban, H. Skenderović, G. Pichler: The use of superbright LEDs in atomic and molecular spectroscopy, 6th EPS Conference on Atomic and Molecular Physics, (1998), Siena, Italy.

Membership:

- European Physical Society

Member of Conference Local Organising Committee:

- Laser Control and Molecular Switches
The Brijuni Conference, Brijuni, Croatia (2005.), <http://brijuni2005.ifs.hr>
- Laser Pulse Shaping and Coherent Control of Molecules
The Brijuni Conference, Brijuni, Croatia (2007.), <http://brijuni2007.ifs.hr>

Community service:

- Main organiser of the Open Days (science Fair) at the Institute of Physics, 2004.
- Lecturer for elementary and high-school students at the Open Days of the Institute of Physics, 2007. and 2008.
- Lecturer for public at the Science Festival, Zagreb, Croatia, 2006., 2007., 2008.,