Tamás Szidarovszky

Nationality: Hungarian

(+36) 205279066

Date of birth: 06/09/1985

Email address: tamas821@caesar.elte.hu

Website: http://kkrk.chem.elte.hu/tamas821/

Address : Pázmány Péter sétány 1/A. (office 5.116), 1117 Budapest (Hungary)

WORK EXPERIENCE

Research associate
Eötvös Loránd University (ELTE) [2017 – Current]

Assistant professor
The University of Tokyo - Yamanouchi Laboratory [2016 – 2017]

JSPS postdoctoral fellow
The University of Tokyo - Yamanouchi Laboratory [2014 – 2016]

Research assistant
ELTE and MTA-ELTE Research Group on Complex Chemical Systems [2012 – 2014]

EDUCATION AND TRAINING

PhD in Theoretical Chemistry
Eötvös Loránd University (ELTE), group of Prof. Attila G. Császár [2009 – 2012]

Thesis : Rovibrational spectra near dissociation

BSc in Physics
Eötvös Loránd University (ELTE), supervisor: Dr. Zoltán Kaufmann [2009 – 2013]

Thesis : Semiclassical study of molecules (in Hungarian)

MSc in Chemistry
Eötvös Loránd University (ELTE), supervisors: Prof. Attila G. Császár and Dr. Gábor Czakó [2004 – 2009]

Thesis : Variational computation of complete molecular spectra (in Hungarian)

Short research visit
University of Arizona, AZ, USA, group of Prof. Árpád Somogyi [2008]

Field(s) of study: Automatization of mass spectra analysis

Short research visit
University of Arizona, AZ, USA, group of Prof. Árpád Somogyi [2006]

Field(s) of study: Investigating the tholin-water reaction using high-resolution mass spectrometry

PUBLICATIONS

2020

(40) Spectroscopic signatures of HHe_2^+ and HHe_3^+

M. Töpfer, A. Jensen, K. Nagamori, H. Kohguchi, T. Szidarovsky, A. G. Császár, S. Schlemmer and O. Asvany *Phys. Chem. Chem. Phys. accepted for publication*.

(39) Rotational-vibrational resonance states

A. G. Császár, I. Simkó, T. Szidarovszky, G. C. Groenenboom, T. Karman and Ad van der Avoird *Phys. Chem. Chem. Phys.,* **22**, 15081-15104 (2020).

(38) Three-player polaritons: nonadiabatic fingerprints in an entangled atom-molecule-photon system

T. Szidarovszky, G. J. Halász and Á. Vibók *New J. Phys.* 22, 053001 (2020).

(37) Robust field-dressed spectra of diatomics in an optical lattice

M. Pawlak, T. Szidarovszky, G. J. Halász and Á. Vibók *Phys. Chem. Chem. Phys.* 22, 3715-3723 (2020).

(36) Excited-state populations in the multiconfiguration time-dependent Hartree-Fock method

E. Lötstedt, T. Szidarovszky, F. H. M. Faisal, T. Kato and K. Yamanouchi *J. Phys. B*, 53, 105601 (2020).

2019

(35) Infrared signatures of the HHe_n^+ and DHe_n^+, n = 3-6, complexes

O. Asvany, S. Schlemmer, T. Szidarovszky and A. G. Császár *J. Phys. Chem. Lett.* 10, 5325-5330 (2019).

(34) Rovibronic spectra of molecules dressed by light fields

T. Szidarovszky, A. G. Császár, G. J. Halász and Á. Vibók *Phys. Rev. A* 100, 033414 (2019).

(33) Toward automated variational computation of rovibrational resonances. A case study of the H_2 dimer

I. Simkó, T. Szidarovszky and A. G. Császár *J. Chem. Theory Comput.* 15, 4156-4169 (2019).

(32) Fingerprints of microscopic superfluidity in HHe_n^+ clusters

A. G. Császár, T. Szidarovszky, O. Asvany and S. Schlemmer *Mol. Phys.* 117, 1559-1583 (2019).

2018

(31) Conical intersections induced by quantum light: field-dressed spectra from the weak to the ultrastrong coupling regimes

T. Szidarovszky, G. J. Halász, A. G. Császár, Lorenz S. Cederbaum and Á. Vibók *J. Phys. Chem. Lett.* 9, 6215-6223 (2018).

(30) Direct signatures of light-induced conical intersections on the field-dressed spectrum of Na_2

T. Szidarovszky, G. J. Halász, A. G. Császár, Lorenz S. Cederbaum and Á. Vibók *J. Phys. Chem. Lett.* 9, 2739-2745 (2018).

(29) Rovibrational resonances in H_2He^+

D. Papp, A. G. Császár, K. Yamanouchi and T. Szidarovszky, *J. Chem. Theory Comput.* 14, 1523-1533 (2018).

(28) LIMAO: Cross-platform software for simulating laser-induced alignment and orientation dynamics of linear-, symmetric- and asymmetric tops

T. Szidarovszky, M. Jono and K. Yamanouchi, *Comput. Phys. Commun.* 228, 219-228 (2018).

2017

(27) A general variational approach for computing rovibrational resonances of polyatomic molecules. Application to the weakly bound $H_2He^{\pm}$ and H_2·CO systems

D. Papp, T. Szidarovszky and A. G. Császár, *J. Chem. Phys.* 147, 094106 (2017).

(26) Recommended ideal-gas thermochemical functions for heavy water and its substituent isotopologues

I. Simkó, T. Furtenbacher, J. Hrubý, N. F. Zobov, O. L. Polyansky, J. Tennyson, R. R. Gamache, T. Szidarovszky, N. Dénes and A. G. Császár, *J. Phys. Chem. Ref. Data* 46, 023104 (2017).

(25) Full-dimensional simulation of the laser-induced alignment dynamics of $H_2He^{\pm}$

T. Szidarovszky and K. Yamanouchi, *Mol. Phys. (André D. Bandrauk Special Issue)* 115, 1916-1926 (2017).

(24) Complex rovibrational dynamics of the Ar-$NO^{\pm}$ complex

D. Papp, T. Szidarovszky, J. Sarka, E. Mátyus, A. G. Császár, M. Hochlaf and T. Stoecklin, *Phys. Chem. Chem. Phys.* 19, 8152-8160 (2017).

2016

(23) Photodissociation dynamics of weakly bound $HeH_2^{\pm}$ in intense light fields

T. Szidarovszky and K. Yamanouchi, *Phys. Rev. A* 94, 063405 (2016).

(22) Definitive ideal-gas thermochemical functions of the $H_2{}^{16}O$ molecule

T. Furtenbacher, T. Szidarovszky, J. Hrubý, A. A. Kyuberis, N. F. Zobov, O. L. Polyansky, J. Tennyson and A. G. Császár, *J. Phys. Chem. Ref. Data* 45, 043104, (2016).

(21) Fragmentation of long-lived hydrocarbons after strong field ionization

S. Larimian, S. Erattupuzha, E. Lötstedt, T. Szidarovszky, R. Maurer, S. Roither, M. Schöffler, D. Kartashov, A. Baltuška, K. Yamanouchi, M. Kitzler and X. Xie, *Phys. Rev. A* 93, 053405 (2016).

2015

(20) Modelling rotations, vibrations, and rovibrational couplings in astructural molecules - a case study based on the $H_5^{\pm}$ molecular ion

J. Sarka, C. Fábri, T. Szidarovszky, A. G. Császár, Z. Lin and A. B. McCoy, *Mol. Phys.* 113, 1873-1883 (2015).

(19) Toward accurate thermochemistry of the ^{24}MgH, ^{25}MgH, and ^{26}MgH molecules at elevated temperatures: corrections due to unbound states

T. Szidarovszky and A. G. Császár, *J. Chem. Phys.* 142, 014103 (2015).

2014

(18) Modelling non-adiabatic effects in $H_3^{\pm}$: solution of the rovibrational Schrödinger equation with motion-dependent masses and mass surfaces

E. Mátyus, T. Szidarovszky and A. G. Császár, *J. Chem. Phys.* 141, 154111 (2014).

(17) Grid-based empirical improvement of molecular potential energy surfaces

T. Szidarovszky and A. G. Császár, *J. Phys. Chem. A* 118, 6256-6265 (2014).

(16) IUPAC critical evaluation of the rotational-vibrational spectra of water vapor. Part IV. Energy levels and transition wavenumbers for $D_2{}^{16}O$, $D_2{}^{17}O$, and $D_2{}^{18}O$

J. Tennyson, P. F. Bernath, L. R. Brown, A. Campargue, A. G. Császár, L. Daumont, R. R. Gamache, J. T. Hodges, O. V. Naumenko, O. L. Polyansky, L. S. Rothman, A. C. Vandaele, N. F. Zobov, N. Dénes, A. Z. Fazliev, T. Furtenbacher, I. E. Gordon, S.-M. Hu, T. Szidarovszky and I. A. Vasilenko, *J. Quant. Spectr. Rad. Transfer* 142, 93-108 (2014).

2013

(15) Analysis of the rotational-vibrational states of the molecular ion H_3^+

T. Furtenbacher, T. Szidarovszky, E. Mátyus, C. Fábri and A. G. Császár, *J. Chem. Theory Comput.* 9, 5471-5478 (2013).

(14) Low-lying quasibound rovibrational states of $H_2{}^{16}O$

T. Szidarovszky and A. G. Császár, *Mol. Phys. (Martin Quack Special Issue)* 111(14-15), 2131-2146 (2013).

(13) MARVEL analysis of the rotational-vibrational states of the molecular ions H_2D^+ and D_2H^+

T. Furtenbacher, T. Szidarovszky, C. Fábri and A. G. Császár, *Phys. Chem. Chem. Phys. (Themed Issue on Spectroscopy and Dynamics of Medium-Sized Molecules and Clusters)* 15, 10181-10193 (2013).

2012

(12) Molecular structure and dynamics (in Hungarian)

A. G. Császár, G. Czakó, T. Furtenbacher, E. Mátyus, C. Fábri, T. Szidarovszky, I. Szabó and J. Sarka, *Magy. Kem. Foly.* 118, 181-189 (2012).

(11) Precision measurements and computations of transition energies in rotationally cold triatomic hydrogen ions up to the mid-visible spectral range

M. Pavanello, L. Adamowicz, A. Alijah, N. F. Zobov, I. I. Mizus, O. L. Polyansky, J. Tennyson, T. Szidarovszky, A. G. Császár, M. Berg, A. Petrignani, A. Wolf, *Phys. Rev. Lett.* 108, 023002 (2012).

(10) Calibration-quality adiabatic potential energy surfaces for H_3^+ and its isotopologues

M. Pavanello, L. Adamowicz, A. Alijah, N. F. Zobov, I. I. Mizus, O. L. Polyansky, J. Tennyson, T. Szidarovszky and A. G. Császár, *J. Chem. Phys.* 136, 184303 (2012).

(9) The role of axis embedding on rigid rotor decomposition (RRD) analysis of variational rovibrational wave functions

T. Szidarovszky, C. Fábri and A. G. Császár, *J. Chem. Phys.* 136, 174112 (2012).

(8) A Paradox of grid-based representation techniques: accurate eigenvalues from inaccurate matrix elements

V. Szalay, T. Szidarovszky, G. Czakó and A. G. Császár, *J. Math. Chem.* 50, 636-651 (2012).

(7) Spectroscopy of H_3^+ based on a new high accuracy global potential energy surface

O. L. Polyansky, A. Alijah, N. F. Zobov, I. I. Mizus, R. I. Ovsyannikov, J. Tennyson, L. Lodi, T. Szidarovszky and A. G. Császár, *Phil. Trans. R. Soc. A* 370, 5014-5027 (2012).

(6) The fourth age of quantum chemistry: molecules in motion

A. G. Császár, C. Fábri, T. Szidarovszky, E. Mátyus, T. Furtenbacher and G. Czakó, *Phys. Chem. Chem. Phys.* 14(3), 1085-1106 (2012).

2011

(5) Gas-phase and Ar-matrix SQM scaling factors for various DFT functionals with basis sets including polarization and diffuse functions

C. Fábri, T. Szidarovszky, G. Magyarfalvi and Gy. Tarczay, *J. Phys. Chem. A* 115 (18), 4640-4649 (2011).

2010

(4) Assigning quantum labels to variationally computed rotational-vibrational eigenstates of polyatomic molecules

E. Mátyus, C. Fábri, T. Szidarovszky, G. Czakó, W. D. Allen and A. G. Császár, *J. Chem. Phys.* 133, 034113 (2010).

(3) On the efficiency of treating singularities in triatomic variational vibrational computations. The vibrational states of H_3^+ up to dissociation

T. Szidarovszky, A. G. Császár and G. Czakó, *Phys. Chem. Chem. Phys.* 12, 8373-8386 (2010).

(2) First-principles prediction and partial characterization of the vibrational states of water up to dissociation

A. G. Császár, E. Mátyus, T. Szidarovszky, L. Lodi, N. F. Zobov, S. V. Shirin, O. L.Polyansky and J. Tennyson, *J. Quant. Spectr. Rad. Transfer* 111(9), 1043-1064 (2010).

2009

(1) Conformers of gaseous threonine

T. Szidarovszky, G. Czakó and A. G. Császár, *Mol. Phys. (Henry F. Schaefer Special Issue)* 107(8-12), 761-775 (2009).

Book chapters

(B3) Exact numerical methods for stationary-state-based quantum dynamics of complex polyatomic molecules

A. G. Császár, C. Fábri, T. Szidarovszky, in *Molecular Spectroscopy and Quantum Dynamics*, in press.

(B2) Light-dressed spectroscopy of molecules

T. Szidarovszky, A. G. Császár, G. J. Halász, Á. Vibók, in *Progress in Ultrafast Intense Laser Science* volume XV, chapter 4.

(B1) Laser-induced alignment and orientation dynamics beyond the rigid-rotor approximation

T. Szidarovszky, K. Yamanouchi, in *Progress in Ultrafast Intense Laser Science* volume XIV, chapter 2.

List of publications available on

Google Scholar, Publons, Scopus or on the Hungarian Scientific Bibliography

FELLOWSHIPS, PRIZES

Prizes

- Academic Youth Prize (Hungarian Academy of Sciences, 2020)
- 'Excellent researcher of the Institute' (Institute of Chemistry, Eötvös Loránd University, 2019)
- 'Excellent student of the Faculty' (Faculty of Sciences, Eötvös Loránd University, 2007)

Fellowships

- FK20 Grant (NKFIH Young Researcher Excellence Program, 2020 - 2024)
- Bolyai+ Young Researcher Fellowship (New National Excellence Program, 2020)
- Bolyai János Research Fellowship (Hungarian Academy of Sciences, 2020 - 2023)
- PD17 Fellowship (NKFIH Postdoctoral Excellence Program, 2017 - 2020)
- JSPS Postdoctoral Fellowship (Japan Society for the Promotion of Science, 2014 - 2016)
- Erdős Pál Young Researcher Fellowship (National Excellence Program, 2014)
- Scholarship of the Hungarian Republic (2007 - 2008)

COMMUNITY SERVICE

Member, Reviewer Board (Photonics, MDPI)

[2020 – Current]

Member, public body of the Hungarian Academy of Sciences

[2018 – Current]

AMMB Working Committee, Committee on Physical Chemistry, Section of Chemical Sciences

Science communication

- **Presenter at Turbine Academy** (Budapest, Hungary, 2019)
- **Finalist of FameLab Hungary** (Hungarian Academy of Sciences, 2019)
- **Science Dialogue presenter** (Hikawa Highshcool, Yamanashi, Japan, 2015)
- **Presenter at AtomCsill** (Eötvös Loránd University, Institute of Physics, 2013)