List of scientific or achievements

Katarzyna Bielska

I. INFORMATION ON SCIENTIFIC OR ARTISTIC ACHIEVEMENTS SET OUT IN ART. 219 PARA 1. POINT 2 OF THE ACT

Title of the achievement: „Precise spectroscopy of weak lines of molecules of atmospheric importance"

H1. O. L. Polyansky, **K. Bielska**, M. Ghysels, L. Lodi, N. F. Zobov, J. T. Hodges, J. Tennyson, *High-accuracy CO_2 line intensities determined from theory and experiment*, Phys. Rev. Lett. **114**, 243001 (2015)
IF: 7.645, Ministry points: 200 (45)
My contribution to the work concerned its experimental part. I adapted the CRDS spectrometer to the measurements using the FARS-CRDS technique, I designed the sample pressure stabilization system working under gas flow conditions and the resonance cavity temperature stabilization system. I made pilot measurements and I prepared the measurement plan. I analyzed the obtained spectroscopic data and based on it I determined the experimental values of line intensities, apart from taking into account the sample isotopic composition (analysis of the sample's isotopic composition based on its origin was done by J. T. Hodges). I simulated the influence of the background structure on the determined line intensity and estimated its contribution to the uncertainty of the determined line intensity.

H2. **K. Bielska**, S. Wójtewicz, P. Morzyński, P. Ablewski, A. Cygan, M. Bober, J. Domysławska, M. Zawada, R. Ciuryło, P. Masłowski, D. Lisak, *Absolute frequency determination of molecular transition in the Doppler regime at kHz level of accuracy*, J. Quant. Spectrosc. Radiat. T **201**, 156-160 (2017)
IF: 2.600, Ministry points: 100 (35)
My contribution to the work consisted in the implementation and programming of a part of the spectrometer enabling the linking of the spectrum frequency axis to the frequency of the optical atomic clock. I performed most of the measurements and the data analysis. I prepared the results for publication and wrote most of the publication text, I am the corresponding author.

H3. **K. Bielska**, J. Domysławska, S. Wójtewicz, A. Balashov, M. Słowiński, M. Piwiński, A. Cygan, R. Ciuryło, D. Lisak, *Simultaneous observation of speed dependence and Dicke narrowing for self-perturbed P-branch lines of O_2 B band*, J. Quant. Spectrosc. Radiat. T **276**, 107927 (2021)
IF: 2.468, Ministry points: 100 (100)
My contribution to the work consisted in developing a concept for the reconstruction of the spectrometer and participation in this reconstruction. I developed a measurement plan and made some of them. I analyzed the obtained spectroscopic data and prepared the results for publication. I prepared most of the publication text, I am the corresponding author.

H4. **K. Bielska**, A. Cygan, M. Konefał, G. Kowzan, M. Zaborowski, D. Charczun, S. Wójtewicz, P. Wcisło, P. Masłowski, R. Ciuryło, D.Lisak, *Frequency-based dispersion Lamb-dip spectroscopy in a high finesse optical cavity*, Opt. Express **29**, 39449-39460 (2021)
IF: 3.894, Ministry points: 140 (140)
My contribution to the work was to plan the measurements and make most of them. I did most of the experimental data analysis. I analyzed the dependence of the Lamb dip position on the way of fitting the shape of the cavity mode (CMDS and CMWS techniques) and decay (CRDS technique) presented in Fig. 3, leading to the conclusion which technique gives the most reliable results. I prepared the results for publication and most of the article text, I am the corresponding author.
The paper was featured as „Editor's pick".

H5. **K. Bielska**, A. A. Kyuberis, Z. D. Reed, G. Li, A. Cygan, R. Ciuryło, E. M. Adkins, L. Lodi, N. F. Zobov, V. Ebert, D. Lisak, J. T. Hodges, J. Tennyson, O. L. Polyansky, *Sub-promille measurements and calculations of CO (3–0) overtone line intensities*, Phys. Rev. Lett. **129**, 043002 (2022)
IF: 9.161, Ministry points: 200 (200)
The paper compares the results of measurements carried out at the Institute of Physics of the Nicolaus Copernicus University, NIST (National Institute of Standards and Technology) and PTB (Physikalisch-Technische Bundesanstalt), as well as the calculations made by the group from UCL (University College London). My contribution to the work concerned the measurements carried out at the Nicolaus Copernicus University. Together with D. Lisak, I chose the measurement conditions. I carried out the measurements and performed most of the data analysis. Together with D. Lisak, I performed the measurement uncertainty analysis. On the part of the Nicolaus Copernicus University, I coordinated collaboration with authors from other institutions and participated in the editing the publication text.
The paper was featured as „Editors' Suggestion".

II. INFORMATION ON SCIENTIFIC OR ARTISTIC ACTIVITY

II.1. List of published scientific monographs (including the monographs not mentioned in section I).

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II.2. List of published chapters in scientific monographs.

Before PhD

1. P. Masłowski, **K. Bielska**, A. Cygan, R. Ciuryło, R. Trawiński, *Rola pomiaru częstotliwości w pomiarach i analizie kształtu linii widmowych*, str. 387-463, w *Problemy metrologii elektronicznej i fotonicznej*, tom II, red. J. Mroczka, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 2009 (in Polish)
IF: –, Ministry points: 0 (3)

II.3. Information about membership in editorial boards preparing scientific monographs for publication.

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II.4. List of articles published in scientific journals (including the articles not mentioned in section I).

Items included in the achievement presented in the section I are marked with an asterisk. IFs are based on the year of publication, except for 2022 publications for which a 2021 or 2020 value is provided, subject to availability. The number of points of the Ministry of Science and Higher Education is given in accordance with the table published in 2021, while in parentheses - the number in accordance with the year of publication.

II.4.1. Before PhD

1. P. Masłowski, J. Domysławska, **K. Bielska**, R. Ciuryło, D. Lisak, R. S. Trawiński, J. Szudy, *Asymmetry of hyperfine-structure components of the* $5^1S_0 - 5^3P_1$ ^{113}*Cd line perturbed by argon*, Eur. Phys. J. Special Topics, **144**, 239-242 (2007), doi: 10.1140/epjst/e2007-00134-7
IF: – , Ministry points: 70 (3)

2. P. Masłowski, **K. Bielska**, R. S. Trawiński, *Pressure broadening of hyperfine-structure components of the* $5^1S_0 - 5^3P_1$ ^{113}*Cd line perturbed by argon*, Eur. Phys. J. Special Topics **144**, 243-245 (2007), doi: 10.1140/epjst/e2007-00135-6
IF: – , Ministry points: 70 (3)

3. P. Masłowski, **K. Bielska**, A. Cygan, J. Domysławska, D. Lisak, R. Ciuryło, A. Bielski, R. S. Trawiński, *The hyperfine and isotope structure of the intercombination ^{113}Cd line - revisited*, Eur. Phys. J. D **51**, 295-302 (2009), doi: 10.1140/epjd/e2008-00242-8
IF: 1.420, Ministry points: 40 (20)

4. N. Shiga, Y. Li, H. Ito, S. Nagano, T. Ido, **K. Bielska**, R. S. Trawiński, R. Ciuryło, *Buffer-gas-induced collision shift for the ^{88}Sr $^1S_0-^3P_1$ clock transition*, Phys. Rev. A **80**, 030501(R) (2009), doi: 10.1103/PhysRevA.80.030501
IF: 2.866, Ministry points: 100 (24)

5. D. Lisak, P. Masłowski, A. Cygan, **K. Bielska**, S. Wójtewicz, M. Piwiński, J. T. Hodges, R. S. Trawiński, R. Ciuryło, *Line shapes and intensities of self-broadened O_2 $b^1\Sigma_g^+(\nu=1) \leftarrow X^3\Sigma_g^-(\nu=0)$ band transitions measured by cavity ring-down spectroscopy*, Phys. Rev. A **81**, 042504 (2010), doi: 10.1103/PhysRevA.81.042504
IF: 2.861, Ministry points: 100 (32)

6. A. Cygan, D. Lisak, P. Masłowski, **K. Bielska**, S. Wójtewicz, J. Domysławska, R. S. Trawiński, R. Ciuryło, H. Abe, J. T. Hodges, *Pound-Drever-Hall-locked, frequency-stabilized cavity ring-down spectrometer*, Rev. Sci. Instrum. **82**, 063107 (2011), doi: 10.1063/1.3595680
IF: 1.367, Ministry points: 70 (30)

7. D. A. Long, **K. Bielska**, D. Lisak, D. K. Havey, M. Okumura, C. E. Miller, J. T. Hodges, *The air-broadened, near-infrared CO_2 line shape in the spectrally isolated regime: evidence of simultaneous Dicke narrowing and speed dependence*, J. Chem. Phys. **135**, 064308 (2011), doi: 10.1063/1.3624527
IF: 3.333, Ministry points: 100 (35)

II.4.2. After PhD

8. D. Lisak, A. Cygan, **K. Bielska**, M. Piwiński, F. Ozimek, T. Ido, R. Trawiński, R. Ciuryło, *Ultra-narrow laser for optical frequency reference*, Acta Phys. Pol. A **121**, 614-621 (2012), doi: 10.12693/APhysPolA.121.614
IF: 0.531, Ministry points: 70 (15)

9. **K. Bielska**, D. K. Havey, G. E. Scace, D. Lisak, J. T. Hodges, *Spectroscopic measurement of the vapor pressure of ice*, Phil. Trans. R. Soc. A **370**, 2509-2519 (2012), doi: 10.1098/rsta.2011.0188
IF: 2.891, Ministry points: 100 (40)

10. M. Bober, J. Zachorowski, W. Gawlik, P. Morzyński, M. Zawada, D. Lisak, A. Cygan, **K. Bielska**, M. Piwiński, R.S. Trawiński, R. Ciuryło, F. Ozimek, C. Radzewicz, *Precision spectroscopy of cold strontium atoms, towards optical atomic clock*, Bull. Pol. Acad. Sci.-Te. **60**, 707-710 (2012), doi: 10.2478/v10175-012-0082-x
IF: 0.980, Ministry points: 100 (30)

11. **K. Bielska**, D. K. Havey, G. E. Scace, D. Lisak, A. H. Harvey, J. T. Hodges, *High-accuracy measurements of the vapor pressure of ice referenced to the triple point*, Geophys. Res. Lett. **40**, 6303-6307 (2013), doi: 10.1002/2013GL058474
IF: 4.456, Ministry points: 140 (40)

12. A. Cygan, S. Wójtewicz, J. Domysławska, P. Masłowski, **K. Bielska**, M. Piwiński, K. Stec, R. Trawiński, F. Ozimek, C. Radzewicz, H. Abe, T. Ido, J. T. Hodges, D. Lisak, R. Ciuryło, *Spectral line-shapes investigation with Pound-Drever-Hall-locked frequency-stabilized cavity ring-down spectroscopy*, Eur. Phys. J.-Spec. Top. **222**, 2119-2142 (2013), doi: 10.1140/epjst/e2013-01990-0
IF: 1.760, Ministry points: 70 (25)

13. D. A. Long, L. Gameson, G.-W. Truong, **K. Bielska**, A. Cygan, J. T. Hodges, J. R. Whetstone, R. D. van Zee, *The effects of variations in buffer gas mixing ratios on commercial carbon dioxide cavity ring-down spectroscopy sensors*, J. Atmos. Ocean. Tech. **30**, 2604–2609 (2013), doi: 10.1175/JTECH-D-13-00039.1
IF: 1.820, Ministry points: 100 (35)

14. J. Domysławska, S. Wójtewicz, A. Cygan, **K. Bielska**, D. Lisak, P. Masłowski, R. S. Trawiński, R. Ciuryło, *Low-pressure line-shape study in molecular oxygen with absolute frequency reference*, J. Chem. Phys. **139**, 194312 (2013), doi: 10.1063/1.4830219
IF: 3.122, Ministry points: 100 (35)

15. J. Courtois, **K. Bielska**, J. T. Hodges, *Differential cavity ring-down spectroscopy*, J. Opt. Soc. Am. B: Opt. Phys. **30**, 1486-1495 (2013), doi: 10.1364/JOSAB.30.001486
IF: 1.806 , Ministry points: 70 (35)

16. D. A. Long, A. J. Fleisher, K. O. Douglass, S. E. Maxwell, **K. Bielska**, J. T. Hodges, D. F. Plusquellic, *Multiheterodyne spectroscopy with optical frequency combs generated from a continuous-wave laser*, Opt. Lett. **39**, 2688-2690 (2014), doi: 10.1364/OL.39.002688
IF: 3.292, Ministry points: 140 (40)

17. M. Bober, P. Morzyński, A. Cygan, D. Lisak, P. Masłowski, M. Prymaczek, P. Wcisło, P. Ablewski, M. Piwiński, S. Wójtewicz, **K. Bielska**, D. Bartoszek-Bober, R. S. Trawiński, M. Zawada, R. Ciuryło, J. Zachorowski, M. Piotrowski, W. Gawlik, F. Ozimek, Cz. Radzewicz, *Strontium optical lattice clocks for practical realization of the metre and secondary representation of the second*, Meas. Sci. Technol. **26**, 0075201 (2015), doi: 10.1088/0957-0233/26/7/075201
IF: 1.492, Ministry points: 70 (30)

18. J. Domysławska, S. Wójtewicz, P. Masłowski, A. Cygan, **K. Bielska**, R. S. Trawiński, R. Ciuryło, D. Lisak, *Spectral line shapes and frequencies of the molecular oxygen B-band R-branch transitions*, J. Quant. Spectrosc. Radiat. T **155**, 22-31 (2015), doi: 10.1016/j.jqsrt.2014.12.015
IF: 2.859, Ministry points: 100 (35)

19. *O. L. Polyansky, **K. Bielska**, M. Ghysels, L. Lodi, N. F. Zobov, J. T. Hodges, J. Tennyson, *High-accuracy CO_2 line intensities determined from theory and experiment*, Phys. Rev. Lett. **114**, 243001 (2015), doi: 10.1103/PhysRevLett.114.243001
IF: 7.645, Ministry points: 200 (45)

20. J. Domysławska, S. Wójtewicz, P. Masłowski, A. Cygan, **K. Bielska**, R. S. Trawiński, R. Ciuryło, D. Lisak, *A new approach to spectral line-shapes of the weak oxygen transitions for atmospheric applications*, J. Quant. Spectrosc. Radiat. T **169**, 111–121 (2016), doi: 10.1016/j.jqsrt.2015.10.019
IF: 2.419, Ministry points: 100 (35)

21. ***K. Bielska**, S. Wójtewicz, P. Morzyński, P. Ablewski, A. Cygan, M. Bober, J. Domysławska, M. Zawada, R. Ciuryło, P. Masłowski, D. Lisak, *Absolute frequency determination of molecular transition in the Doppler regime at kHz level of accuracy*, J. Quant. Spectrosc. Radiat. T **201**, 156-160 (2017), doi: 10.1016/j.jqsrt.2017.07.010
IF: 2.600, Ministry points: 100 (35)

22. S. Wójtewicz, A. Cygan, J. Domysławska, **K. Bielska**, P. Morzyński, P. Masłowski, R. Ciuryło, D. Lisak, *Response of an optical cavity to phase-controlled incomplete power switching of nearly resonant incident light*, Opt. Express **26**, 5644-5654 (2018), doi: 10.1364/OE.26.005644
IF: 3.561, Ministry points: 140 (45)

23. A. Cygan, P. Wcisło, S. Wójtewicz, G. Kowzan, M. Zaborowski, D. Charczun, **K. Bielska**, R. S. Trawiński, R. Ciuryło, P. Masłowski, D. Lisak, *High-accuracy and wide dynamic range frequency-based dispersion spectroscopy in an optical cavity*, Opt. Express **27**, 21810-21821 (2019), doi: 10.1364/OE.27.021810
IF: 3.669, Ministry points: 140 (140)

24. J. Domysławska, S. Wójtewicz, P. Masłowski, **K. Bielska**, A. Cygan, M. Słowiński, R. S. Trawiński, R. Ciuryło, D. Lisak, *Line-shape analysis for high J R-branch transitions of the oxygen B band*, J. Quant. Spectrosc. Radiat. T **242**, 106789 (2020), doi: 10.1016/j.jqsrt.2019.106789
IF: 2.468, Ministry points: 100 (100)

25. *__K. Bielska__, J. Domysławska, S. Wójtewicz, A. Balashov, M. Słowiński, M. Piwiński, A. Cygan, R. Ciuryło, D. Lisak, *Simultaneous observation of speed dependence and Dicke narrowing for self-perturbed P-branch lines of O_2 B band*, J. Quant. Spectrosc. Radiat. T **276**, 107927 (2021), doi: 10.1016/j.jqsrt.2021.107927
IF: 2.468, Ministry points: 100 (100)

26. *__K. Bielska__, A. Cygan, M. Konefał, G. Kowzan, M. Zaborowski, D. Charczun, S. Wójtewicz, P. Wcisło, P. Masłowski, R. Ciuryło, D.Lisak, *Frequency-based dispersion Lamb-dip spectroscopy in a high finesse optical cavity*, Opt. Express **29**, 39449-39460 (2021), doi: 10.1364/OE.443661
IF: 3.894, Ministry points: 140 (140)

27. J. Domysławska, S. Wójtewicz, __K. Bielska__, S. Bilicki, R. Ciuryło, D. Lisak, *Line mixing in the oxygen B band head*, J. Chem. Phys. **156**, 084301 (2022), doi: 10.1063/5.0079158
IF: 3.488, Ministry points: 100 (100)

28. *__K. Bielska__, A. A. Kyuberis, Z. D. Reed, G. Li, A. Cygan, R. Ciuryło, E. M. Adkins, L. Lodi, N. F. Zobov, V. Ebert, D. Lisak, J. T. Hodges, J. Tennyson, O. L. Polyansky, *Subpromille measurements and calculations of CO (3–0) overtone line intensities*, Phys. Rev. Lett. **129**, 043002 (2022), doi: 10.1103/PhysRevLett.129.043002
IF: 9.161, Ministry points: 200 (200)

II.4.3. Publications in conference proceedings

29. P. Masłowski, J. Domysławska, __K. Bielska__, R. Ciuryło, D. Lisak, R. S. Trawiński, J. Szudy, *Isotope effects associated with optical collisions in the Cd–Ar system*, AIP Conf. Proc. **874**, 214 (2006)
IF: – , Ministry points: 0 (0)

30. P. Masłowski, __K. Bielska__, A. Cygan, J. Domysławska, D. Lisak, R. Ciuryło, A Bielski, R.S. Trawiński, *Isotope structure and hyperfine splitting of 326.1 nm ^{113}Cd line*, AIP Conf. Proc. **1058**, 243 (2008), doi: 10.1063/1.3026455
IF: – , Ministry points: 0 (0)

31. P. Masłowski, __K. Bielska__, A. Cygan, J. Domysławska, D. Lisak, R. Ciuryło, J. Szudy, R.S. Trawiński, *Line shape study of the 326.1 nm ^{113}Cd line perturbed by Ar and Xe*, AIP Conf. Proc. **1058**, 240 (2008), doi: 10.1063/1.3026454
IF: – , Ministry points: 0 (0)

32. T. Ido, N. Shiga, Y. Li, H. Ito, S. Nagano, A. Yamaguchi, M. Koide, H. Ishijima, M. Hosokawa, __K. Bielska__, R. Ciuryło, *Background gas induced collision shift for a Sr spin-forbidden transition*, Proc. SPIE **7431**, 74310F (2009), doi: 10.1117/12.825471
IF: –, Ministry points: 0 (0)

33. T. Ido, M. Shiga, Y. Li, H. Ito, S. Nagano, M. Hosokawa, __K. Bielska__, R. Trawiński, R. Ciuryło, *Back ground gas induced collision shift for ^{88}Sr: $^1S_0-^3P_1$ transition*, IEEE International Frequency Control Symposium, 2009 joint with the 22nd European Frequency and Time Forum, IEEE, Piscataway NJ (2009), doi: 10.1109/FREQ.2009.5168381
IF: –, Ministry points: 0 (0)

34. __K. Bielska__, S. Wójtewicz, R. Trawiński, R. Ciuryło, N. Shiga, Y. Li, S. Nagano, T. Ido, J. Mitroy, J.-Y. Zhang, *Broadening and shifting of ^{88}Sr intercombination clock transitions induced by collisions with rare gases*, AIP Conf. Proc. **1290**, 24 (2010), doi: 10.1063/1.3517565
IF: – , Ministry points: 0 (0)

35. __K. Bielska__, D. K. Havey, G. E. Scace, D. Lisak, J. T. Hodges, *Application of precise line shape measurements to determine the vapor pressure of ice in the temperature range from 0 to -70°C*, AIP Conf. Proc. **1290**, 169 (2010), doi: 10.1063/1.3517549
IF: – , Ministry points: 0 (0)

36. A. Cygan, D. Lisak, P. Masłowski, **K. Bielska**, S. Wójtewicz, J. Domysławska, H. Abe, J. T. Hodges, R. Trawiński, R. Ciuryło, *Frequency–stabilized cavity ring-down spectroscopy with a PDH locked laser*, AIP Conf. Proc. **1290**, 204 (2010), doi: 10.1063/1.3517556
IF: – , Ministry points: 0 (0)

37. D. Lisak, P. Masłowski, A. Cygan, **K. Bielska**, S. Wójtewicz, M. Piwiński, J. T. Hodges, R. Trawiński, R. Ciuryło, *CRDS investigation of line shapes and intensities of the oxygen B-band transitions at low pressures*, AIP Conf. Proc. **1290**, 174 (2010), doi: 10.1063/1.3517550
IF: – , Ministry points: 0 (0)

38. J. Domysławska, S. Wójtewicz, D. Lisak, A. Cygan, F. Ozimek, K. Stec, **K. Bielska**, P. Masłowski, Cz. Radzewicz, R. Trawiński, R. Ciuryło, *Transition frequencies of oxygen B-band lines measured with optical frequency comb assisted cavity ring-down spectroscopy*, J. Phys. Conf. Ser. **397** (2012), 012045, doi: 10.1088/1742-6596/397/1/012045
IF: –, Ministry points: 40 (10)

39. M. Bober, J. Zachorowski, W. Gawlik, P. Morzyński, M. Zawada, D. Lisak, A. Cygan, **K. Bielska**, M. Piwiński, R. Trawiński, R. Ciuryło, F. Ozimek, C. Radzewicz, *Towards Polish optical clock with cold strontium atoms, present status and performance*, 2012 European Frequency and Time Forum Proceedings (2012), 400-403, doi: 10.1109/EFTF.2012.6502411
IF: –, Ministry points: 20 (10)

40. J. T. Hodges, D. A. Long, A. J. Fleisher, **K. Bielska**, S. Wójtewicz, *Mode-resolved absorption and dispersion measurements in high-finesse cavities*, Imaging and Applied Optics 2014, LW3D.3 (2014), doi: 10.1364/LACSEA.2014.LW3D.3
IF: –, Ministry points: 0 (0)

41. M. Zawada, M. Bober, P. Morzyński, A. Cygan, D. Lisak, P. Masłowski, M. Prymaczek, P. Wcisło, P. Ablewski, M. Piwiński, S. Wójtewicz, **K. Bielska**, D. Bartoszek-Bober, R. Ciuryło, J. Zachorowski, M. Piotrowski, W. Gawlik, F. Ozimek, C. Radzewicz, *Two independent strontium optical lattice clocks for practical realization of the meter and secondary representation of the second*, 2015 Joint Conference of the IEEE International Frequency Control Symposium & the European Frequency and Time Forum, 2015, str 304 (2015), doi: 10.1109/FCS.2015.7138847
IF: –, Ministry points: 20 (15)

42. J. Domysławska, S. Wójtewicz, P. Masłowski, A. Cygan, **K. Bielska**, R. Trawiński, R. Ciuryło, D. Lisak, *Speed-dependent Voigt profile parameters for oxygen B-band measured by cavity ring-down spectrometer referenced to the optical frequency comb*, J. Phys. Conf. Ser. **810**, 012030 (2017), doi: 10.1088/1742-6596/810/1/012030
IF: –, Ministry points: 40 (15)

43. **K. Bielska**, S. Wójtewicz, P. Morzyński, P. Ablewski, A. Cygan, M. Bober, M. Zawada, R. Ciuryło, P. Masłowski, D. Lisak, *Measurement of oxygen B-band line center frequency in reference to strontium atomic optical clock*, J. Phys. Conf. Ser. **810**, 012024 (2017), doi: 10.1088/1742-6596/810/1/012024
IF: –, Ministry points: 40 (15)

II.5. List of project, engineering and design as well as technological achievements (including the achievements not mentioned in section I).

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II.6. List of public realizations of works of art (including the works not mentioned in section I).

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II.7. Information on presentations given at national or international scientific or arts conferences, including a list of lectures delivered upon invitation and plenary lectures.

II.7.1. Oral presentations during scientific conferences

1. 24th International Conference on High Resolution Molecular Spectroscopy, Prague, Czech Republic, 29.08-3.09.2016, K. Bielska, J. Domysławska, S. Wójtewicz, A. Cygan, P. Masłowski, R.S. Trawiński, P. Morzyński, M. Bober, M. Zawada, R. Ciuryło, D. Lisak, *Precise determination of line shapes and positions of self-perturbed oxygen B-band transitions*

2. 12th International User Meeting and Summer School on Cavity Enhanced Spectroscopy, Egmond an Zee, The Netherlands, 12-15.06.2017, K. Bielska, S. Wójtewicz, J. Domysławska, R. Hashemi, P. Morzyński, P. Wcisło, M. Słowiński, A. Cygan, A. Predoi-Cross, R. Ciuryło, D. Lisak, *Dual-beam frequency-stabilized cavity ring-down spectrometer for precise measurements of spectral line shapes*

3. 25th International Conference on High Resolution Molecular Spectroscopy, Bilbao, Spain, 3-7.09.2018, K. Bielska, J. Domysławska, S. Wójtewicz, A. Cygan, P. Morzyński, M. Słowiński, P. Masłowski, R. Ciuryło, D. Lisak, *Line shape study of oxygen B-band with CRDS in dual-beam configuration*

4. 24th International Conference on Spectral Line Shapes, Dublin, Ireland, 17-22.06.2018, K. Bielska, J. Domysławska, S. Wójtewicz, M. Słowiński, A. Cygan, R. Ciuryło, D. Lisak, *Line shape investigation of O_2 B-band transitions: simultaneous observation of the speed-dependence and Dicke narrowing*

5. 26th Colloquium on High-Resolution Molecular Spectroscopy, Dijon, France, 26-30.08.2019, K. Bielska, A. Cygan, R. Ciuryło, D. Lisak, *Highly accurate CO line intensities determination with cavity mode-dispersion spectroscopy*

6. International Congress on Microscopy and Spectroscopy, Oludeniz, Turkey, 12-18.05.2019, K. Bielska, *High resolution spectroscopy of weak molecular lines in an optical cavity*, referat zaproszony

7. 27th Colloquium on High-Resolution Molecular Spectroscopy, Köln, Germany (Virtual Conference), 29.08-3.09.2021, K. Bielska, A. Cygan, M. Konefał, G. Kowzan, M. Zaborowski, D. Charczun, S. Wójtewicz, P. Wcisło, P. Masłowski, R. Ciuryło, D. Lisak, *Cavity mode-dispersion spectroscopy applied in saturation conditions*

II.7.2. Other oral presentations

1. 28.06.2018, Central Office of Measures, Warsaw, Poland *Ultraprecyzyjny analizator wydechu: budowa, metoda i zakres pomiarowy* (*Ultraprecise exhalation analyzer: structure, method and measuring range*, in Polish)

2. Torun Astrophyscis, Spectroscopy and Quantum Chemistry School, Toruń, Poland, 1-12.07.2019, *Reference molecular spectroscopy for atmospheric applications*

3. 10.06.2021, Thursday Colloquium – seminar of the Institute of Physics NCU, Toruń, *Molecular spectroscopy: towards accurate reference parameters for atmospheric applications*

II.7.3. Poster presentations during scientific conferences

1. 21st Colloquium on High Resolution Molecular Spectroscopy, Castellammare di Stabia, Italy, 31.08-4.09.2009, A. Cygan, K. Bielska, D. Lisak, P. Masłowski, S. Wójtewicz, R. S. Trawiński, R. Ciuryło, *Line intensities and line shapes coeffcients measurements of oxygen B-band using frequency-stabilized cavity ring-down spectroscopy technique*

2. 41st E.G.A.S. Conference, Gdańsk, Poland, 8-11.07.2009, K. Bielska, P. Masłowski, A. Cygan, J. Domysławska, D. Lisak, R. Ciuryło, A. Bielski, J. Szudy, R. S. Trawiński, *Speed dependence and dispersion-like asymmetry of the 326.1 nm ^{113}Cd line perturbed by Ar and Xe*

3. 20th International Conference on Spectral Line Shapes, St. John's, Canada, 6-11.06.2010, K. Bielska, S. Wójtewicz, R. S. Trawiński, R. Ciuryło, N. Shiga, Y. Li, S. Nagano, T. Ido, J. Mitroy, J.-Y. Zhang, *Broadening and shifting of ^{88}Sr intercombination clock transitions induced by collisions with rare gases*

4. 23rd International Conference on Spectral Line Shapes, Toruń, Poland, 19-24.06.2016, K. Bielska, S. Wójtewicz, P. Morzyński, P. Ablewski, A. Cygan, M. Bober, M. Zawada, R. Ciuryło, P. Masłowski, D. Lisak, *Measurement of oxygen B-band line center frequency in reference to strontium atomic clock*

5. 25th Colloqium on High-Resolution Molecular Spectroscopy, Helsinki, Finland, 20-25.08.2017, K. Bielska, S. Wójtewicz, J. Domysławska, M. Słowiński, A. Cygan, R. Ciuryło, D. Lisak, *Spectral line shape investigation in O2 B band with dual beam cavity ring-down spectrometer*

6. 50th Conference of the European Group on Atomic Systems (EGAS), Kraków, Poland, 9-13.07.2018, K.Bielska, J. Domysławska, S. Wójtewicz, A. Cygan, P. Morzyński, M. Słowiński, P. Masłowski, R. Ciuryło, D. Lisak, *Oxygen B-band investigation with cavity ring-down spectroscopy*

7. 15th ASA and 16th HITRAN Conference, Reims, France, 24-26.08.2022, K. Bielska, A. A. Kyuberis, Z. D. Reed, G. Li, A. Cygan, R. Ciuryło, E. M. Adkins, L. Lodi, N. F. Zobov, V. Ebert, D. Lisak, J. T. Hodges, J. Tennyson, O. L. Polyansky, *CO (3–0) band line intensities measured and calculated at permille level of accuracy*

II.8. Information on participation in organizational and scientific committees at national or international conferences, including the applicant's function.

23rd International Conference on Spectral Line Shapes, 19-24.06.2016, Toruń, organizing committee member

II.9. Information on participation in the works of research teams realizing projects financed through national and international competitions, including the projects which have been completed and projects in progress, and information on the function performed in the team.

Completed projects:

1. Grant as part of a project implemented by the Marshal's Office of the Kujawsko-Pomorskie Voivodeship „Stypendia dla doktorantów 2008/2009 – ZPORR" [stipends for PhD students]

2. Ministry of Science and Higher Education, project „Ultraprecyzyjne pomiary metodami optyki i fizyki atomowej" [Ultraprecise measurements with the methods of optics and atomic physics], realized in KL FAMO (National Laboratory of Atomic, Molecular & Optical Physics), implementation period 2007-2009, investigator

3. Foundation for Polish Science, grant TEAM „Precise optical control and metrology of quantum systems", implementation period 2011-2015, investigator (scholarship holder)

4. National science Centre, Poland, grant Sonata 6 „Spektroskopia szerokości modów wnęki (CMWS) nową ultra czułą techniką spektroskopii absorpcyjnej" [Cavity mode width spectroscopy (CMWS) by a new ultra sensitive absorption spectroscopy technique], implementation period 2014-2017, investigator

5. National Science Centre, Poland, grant Sonata 8 „Molecular spectroscopy with reference to the optical atomic clock", contract no. 2014/15/D/ST2/05281, contract amount 399 532 PLN, implementation period 2015-2019, **principal investigator**

6. National Science Centre, Poland, grant Opus 9 „Jednowymiarowa spektroskopia częstotliwościowa" [One-dimensional frequency spectroscopy], implementation period 2016-2019, investigator

Projects in progress:

1. National Science Centre, Poland, grant Sonata Bis 8 „High precision and accuracy spectroscopy of weak molecular lines of atmospheric gases", contract no. 2018/30/E/ST2/00864, contract amount 2 709 500 PLN, implementation period 2019-2024, **principal investigator**

2. European Space Agency, project „Improved Spectroscopy for Carbon Dioxide, Oxygen, and Water Vapour Satellite Measurements", implementation period 2020-2022, investigator

3. project „NLPQT – Narodowe Laboratorium Fotoniki i Technologii Kwantowej" [National Laboratory of Photonics and Quantum Technology], POIR.04.02.00-00-B003/18, realized within Program Operacyjny Inteligentny Rozwój [Intelligent Development Operational Program] for 2014-2020, investigator

4. NCU, „Quantum systems for fundamental research group" project selected in the competition "Priority research teams of the Nicolaus Copernicus University", implementation period 2020-2022, investigator

II.10. Membership in international or national organizations and scientific societies, including the functions performed by the applicant.

Optical Society of America 2009-2010

II.11. Information on internships completed in scientific or artistic institutions, also abroad, including the place, time and duration of the internship and its character.

1. Before PhD.: internship under Dr Joseph T. Hodges at the National Institute of Standards and Technology, Chemical Sciences Division, Gaithersburg MD, USA, 09.2009 - 02.2010. The stay was aimed at strengthening the collaboration between research groups, training in CRDS spectroscopy measurement technique and carrying out measurements of the ice vapor pressure.
   As a result of the internship, papers marked with following numbers on the list in the section II.4 were published: 7, 9 and 11.

2. After PhD: postdoctoral fellowship under the supervision of Dr. Joseph T. Hodges at the National Institute of Standards and Technology, Materials Measurement Division, Gaithersburg MD, USA, in the period 02.2012 - 08.2014.
   As a result of the fellowship, papers marked with following numbers on the list in the section II.4 were published: 13, 15, 16 and 19 (H1).

II.12. Membership in editorial committees and scientific boards of journals, including the functions performed by the applicant (e.g. editor-in-chief, chairman of scientific board etc.).

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II.13. Information on scientific or artistic works reviewed, in particular those published in international journals.

Optics Express, 2017-2022 (3 papers)
Applied Physics B, 2019 (1 paper)
IOP Conference Series: Journal of Physics, 2016 (6 papers)

II.14. Information on participation in European or other international programmes.

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II.15. Information on participation in research teams realizing projects other than those defined in section II.9.

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II.16. Information on membership in the teams assessing applications for financing of research projects, applications for scientific awards, applications in other competitions of scientific or didactic character.

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III. INFORMATION ON COOPERATION WITH SOCIAL AND ECONOMIC ENVIRONMENT

III.1. List of technological works.

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III.2. Information on cooperation with economic sector.

Participation in the project of the European Space Agency „Improved Spectroscopy for Carbon Dioxide, Oxygen, and Water Vapour Satellite Measurements" together with partners from the German Aerospace Centre (DLR, Germany), Laboratoire Interdisciplinaire de Physique/CNRS (LIPhy, France), Universität Bremen (IUP-UB, Germany), Universität Heidelberg (UHEI, Germany).
Participation in the project of building an ethanol concentration analyzer at the Central Office of Measures (Poland).

III.3. Obtaining the right of industrial property, including the national or international patents granted.

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III.4. Information on implemented technologies.

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III.5. Information on performed expert analyses or other studies prepared on request of public institutions or entrepreneurs.

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III.6. Information on participation in expert and competition teams.

Member of the Consultative Metrology Team for Industrial Technologies and Processes, working group for exhaust analyzers, operating at the Central Office of Measures (Poland), since 2017.

III.7. Information on artistic projects realized in non-artistic environment.

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IV. SCIENTOMETRIC INFORMATION

Impact Factor and Ministry points based on data from the Library of the Nicolaus Copernicus University in Toruń, citations and Hirsch index based on Web o Science, as of the day Sept. 9th, 2022.

IV.1. Information on the Impact Factor (in the fields and disciplines in which this parameter is commonly used as a scientometric index).

Information of the Impact factor:

- total for all publications: 78.229
- publications before PhD: 11.847
- publications after PhD: 66.382
- the achievement: 25.768

IV.2. Information on the number of citations of the applicant's publications, including a separate list of self-citations.

Number of citations: 613 (self-citations: 73).

IV.3. Information on *h*-index held.

h-index: 14

IV.4. Information on the number of the points awarded by the Ministry of Science and Higher Education.

Total number of the Ministry points:

- total for all publications: 3090 (according to the 2021 list) or 1515 (according to the list for the year of publication)
- before PhD: 550 (according to the 2021 list) or 150 (according to the list for the year of publication)
- after PhD: 2540 (according to the 2021 list) or 1365 (according to the list for the year of publication)
- the achievement: 740 (according to the 2021 list) or 520 (according to the list for the year of publication)

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Dokument podpisany przez Katarzyna Bielska
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