CURRICULUM VITAE

Nicolas DIETRICH, Ph.D., age 42 years ORCID: 0000-0001-6169-3101
Date of birth: June 12th, 1980 www.ndietrich.com
Nationality: French

CURRENT POSITION

2009 – Today: **Associate Professor** at INSA Toulouse – Chemical Engineering & Environment Department –Toulouse Biotechnology Institute (TBI), Toulouse, France

EDUCATION AND QUALIFICATIONS

2018 **Habilitation** (Habilitation à Diriger des Recherches en Science – HDR), Institut National Polytechnique de Toulouse (INPT), Toulouse, France Title: "Étude de l'hydrodynamique et du transfert de matière aux interfaces gaz-liquide : Les outils de visualisation optiques au service de la modélisation en Génie des Procédés."

2008 **Ph.D. in Chemical Engineering**, Institut National Polytechnique de Lorraine (INPL), Nancy, France Title: "Étude locale et expérimentale des phénomènes interfaciaux". Laboratoire des Sciences du Génie Chimique (LSGC), Nancy. Supervisor: Pr. Huai-Zhi LI & Dr. Souhila Poncin

2005 **Engineering degree** in Chemical Industries (Ingénieur des Industries Chimiques), École Nationale des Industries Chimiques (ENSIC), Institut National Polytechnique de Lorraine (INPL), Nancy, France

2005 **Master's degree** in Chemical Engineering and products, Institut National Polytechnique de Lorraine (INPL), Nancy, France

PREVIOUS POSITIONS

2008 – 2009 Assistant professor (Attaché Temporaire d'Enseignement et de Recherche), ENSIC, Nancy, France

2005 – 2008 Ph. D student, Funding from the French Ministry of Higher Education & Research, LSGC, Nancy, France.

FELLOWSHIPS and GRANTS [5 M€, INCLUDING 2 M€ AS PRINCIPAL INVESTIGATOR OVER 5 YEARS]

2022 – 2023 3BCAR funding (30 k€) – co-Principal Investigator
2022 – 2023 Industrial collaboration with ROCHE company (30 k€) – Principal Investigator
2022 – 2023 ECIU funding for the CARE project (140 k€) - co-Principal Investigator
2022 – 2025 ANRT Thesis funding with Eneapharm company (220 k€) - Principal Investigator
2020 – 2023 Horizon 2020 Science with and for Scoiety – SMART-ER (2.5 M€) – Task leader
2019 – 2020 CNRS – FERMaT funding for a post-doc position (50 k€) – co-Principal Investigator
2019 – 2024 ADEME Research grant "EPUROGAZ" (350 k€) – Partner
2018 – 2021 ANR Young Researcher grant "MaMOTHS" (205 k€) – Principal Investigator
2018 – 2021 Toulouse University APR funding "MEGALITE" (110 k€) – Principal Investigator
2017 – 2021 Industrial collaboration with SUEZ company (75 k€) – co-Principal Investigator
2017 – 2021 Scientific Chinese Scholarship Council funding for a Ph.D. (100 k€) – Principal Investigator
2014 – 2015 Toulouse Tech Interlab funding (15 k€) – Partner
2014 – 2015 French-Korean funding "STAR" (15 k€) – Partner
2014 – 2018 French ministry funding for a Ph.D." (100 k€) – co-Principal Investigator
2015 – 2019 Scientific Chinese Scholarship Council funding for a Ph.D. (100 k€) – Principal Investigator
2014 – 2015 Industrial collaboration with OVERLAB company (30 k€) – co-Principal Investigator
2013 – 2014 CNRS – FERMaT funding for a post-doc position (50 k€) – co-Principal Investigator
2013 – 2016 ADEME funding for a Ph.D (150 k€) – Partner
2013 – 2017 Scientific Chinese Scholarship Council funding for a Ph.D. (100 k€) – Principal Investigator
2011 – 2014 Industrial collaboration with SUEZ company (75 k€) – co-Principal Investigator
2010 – 2012 Technology transfer funding (20 k€) – co-Principal Investigator
2010 – 2013 French ministry funding for a Ph.D." (100 k€) – co- Principal Investigator
2009 – 2012 ANR grant "O_2 Star" (650 k€) – Partner

AWARDS

2022	Laureate of the INRAe-TRANSFORM best picture award
2019	Laureate of the CNRS national contest "La preuve par l'image"
2017 – 2025	Scientific Excellence Award (PEDR)
2013 – 2017	Scientific Excellence Award (PES)
2008	Best Poster Award, annual meeting of the RP2E doctoral school, Nancy, France

PUBLICATIONS

Number of publications:	**65 -** *25% of which as first author, 55% as a corresponding author or last*
(In peer-reviewed journals)	*authors and 33% with an international collaboration over 5 years.*
Total number of citations:	**1800** *(Google Scholar),* ***1300*** *(Scopus)*
(Oct.2022)	*Most cited publication at 180 citations (Google Scholar) and 120 (Scopus).*
H-index:	**24** (Google Scholar) **20** (WoS) **12** (Scopus) - Oct. 2022
Publications in other scientific journals:	**7**
Conferences and communications:	**70**
Invited lectures & Keynote lectures:	**17**
Patents:	**6** (3 *French, 1 European, 1US and 1 World patent).*

INSTITUTIONAL RESPONSIBILITIES

2021 – today	Open Science" referent for INSA Toulouse in the Open Science network of the Conférence des Présidents d'Université (CPU) - Member of the "Comité de réflexion pour la science ouverte" (CéSO) of the Université fédérale Toulouse Midi-Pyrénées (UFTMIP) - Member of the "Science and Society" working group of the Université fédérale Toulouse Midi-Pyrénées (UFTMIP)
2021 – today	Pedagogical referent for the INSA group (8 engineering schools) for Challenge-Based Learning
2020 – today	Co-leader of the research team "Transfert-Interface-Mélange" of Toulouse Biotechnology Institute (TBI INSA/CNRS 5504. UMR INSA/INRA 792) involving 15 researchers and teacher-researchers, 3 technical staff and about 15 PhD students and interns, Toulouse, France.
2015 – today	Head of the Master of Science in "Complex System Engineering" of University of Toulouse, INSA Toulouse, INP Toulouse, IMT Mines d'Albi, (2-year program, 480 ECTS credits, 50 students per year), Toulouse and Albi, France
2018 – today	Co-leader of the "Multiphase Flow" research group of the FERMaT research federation (FR3089) involving 50 scientists and 30 PhD students in the Occitanie region (7 laboratories), Toulouse and Albi, France
2013 – today	Co-Head of the master's degree "Fluid Engineering for Industrial process", (2-year program, 120 ECTS credits, 30 students per year), INSA Toulouse & INP Toulouse, France
2015 – 2022	Head of the 4th year of engineering course in Chemical Engineering (60 ECTS credits, 50 students per year), INSA Toulouse, France
2012 – 2017	Head of the transition semester for international students of the n+i network, 25 students per year, INSA Toulouse, France

COMMISSIONS OF TRUST & EXPERTISE

1 ISF (Israel Science Foundation) research project in 2021 and 2022; 1 NSC (National Science Center, Poland) research project in 2021; 4 MITACS (Canada) research projects in 2017, 2019 and 2020; 1 NCEST (National Center of Science and Technology Evaluation, Azerbaijan) research project in 2020; 1 European educational project (UNLOCK - ERASMUS: http://www.un-lock. eu/); 4 projects for the APR program "thesis grant" of the University of Toulouse in 2019; 5 projects for the interdisciplinary project program "TTIL" of the University of Toulouse in 2019; Various project expertises for the FERMAT research federation council or the scientific council of INSA Toulouse (incoming or outgoing mobility projects, support for the start-up of actions, thesis grant of the scientific board of INSA, etc.) Thesis Jury (outside the institution): 1 reviewer (Germany); University Research Diploma Jury (outside the institution): 2; Thesis Follow-up Committees (outside the institution): 12; Recruitment Commission for the position of Senior Lecturer: 2; Evaluation of scientific articles (8-10 per year: Chemical Engineering Science, Chemical Engineering Journal, AICHE Journal, Heat and Mass Transfer Journal, Journal of Chemical Education etc.) and associate editor of the journal " Processes " (5 articles published per year)

PERSONAL BIBLIOGRAPHY

- Publications in peer-reviewed journals: **65**

[P1] Frank, X., **Dietrich, N.,** Wu, J., Barraud, R., Li, H.Z., 2007. Bubble nucleation and growth in fluids. Chem. Eng. Sci. 62, 7090–7097. https://doi.org/10.1016/j.ces.2007.08.030

[P2] **Dietrich, N**., Poncin, S., Pheulpin, S., Li, H.Z., 2008. Passage of a bubble through a liquid–liquid interface. AIChE J. 54, 594–600, https://aiche.onlinelibrary.wiley.com/doi/10.1002/aic.11399

[P3] **N. Dietrich,** S. Poncin, N. Midoux, Huai Z. Li, 2008. Bubble Formation Dynamics in Various Flow-Focusing Microdevices. Langmuir 24, 13904–13911. https://doi.org/10.1021/la802008k

[P4] Jamnongwong, M., Loubiere, K., **Dietrich, N**., Hébrard, G., 2010. Experimental study of oxygen diffusion coefficients in clean water containing salt, glucose or surfactant: Consequences on the liquid-side mass transfer coefficients. Chem. Eng. J. 165, 758–768. https://doi.org/10.1016/j.cej.2010.09.040

[P5] **Dietrich, N**., Poncin, S., Li, H.-Z., 2011a. Experimental study of the bubble formation in T-Y junction micro-mixers. International Journal of Water, 62–69. https://doi.org/10.1051/lhb/2011042

[P6] François, J., **Dietrich, N**., Guiraud, P., Cockx, A., 2011. Direct measurement of mass transfer around a single bubble by micro-PLIFI. Chem. Eng. Sci. 66, 14, 3328-3338. https://doi.org/10.1016/j.ces.2011.01.049

[P7] **Dietrich, N**., Poncin, S., Li, H.Z., 2011. Dynamical deformation of a flat liquid–liquid interface. Exp. Fluids. https://doi.org/10.1007/s00348-010-0989-7

[P8] François, J., **Dietrich, N**., Cockx, A., 2011. A Novel Methodology to Measure Mass Transfer around a Bubble. Mod. Phys. Lett. B 25, 1993–2000. https://doi.org/10.1142/S0217984911027236

[P9] Jimenez, M., **Dietrich, N**., Hébrard, G., 2012. A new method for measuring diffusion coefficient of gases in liquids by PLIF. Mod. Phys. Lett. B 26, 1150034. https://doi.org/10.1142/S0217984911500345

[P10] Jimenez, M., **Dietrich, N.,** Cockx, A., Hébrard, G., 2013. Experimental study of O2 diffusion coefficient measurement at a planar gas–liquid interface by planar laser-induced fluorescence with inhibition. AIChE J. 59, 325–333. https://doi.org/10.1002/aic.13805

[P11] **Dietrich, N**., Mayoufi, N., Poncin, S., Li, H.-Z., 2013. Experimental investigation of bubble and drop formation at submerged orifices. Chem. Pap. 67, 313–325. https://doi.org/10.2478/s11696-012-0277-5

[P12] Kherbeche, A., Milnes, J., Jimenez, M., **Dietrich, N.,** Hébrard, G., Lekhlif, B., 2013. Multi-scale analysis of the influence of physicochemical parameters on the hydrodynamic and gas–liquid mass transfer in gas/liquid/solid reactors. Chem. Eng. Sci. 100, 515–528. https://doi.org/10.1016/j.ces.2013.06.025

[P13] **Dietrich, N**., Loubière, K., Jimenez, M., Hébrard, G., Gourdon, C., 2013. A new direct technique for visualizing and measuring gas–liquid mass transfer around bubbles moving in a straight millimetric square channel. Chem. Eng. Sci. 100, 172–182. https://doi.org/10.1016/j.ces.2013.03.041

[P14] Jimenez, M., **Dietrich, N**., Hébrard, G., 2013. Mass transfer in the wake of non-spherical air bubbles quantified by quenching of fluorescence. Chem. Eng. Sci., 100, 160–171. https://doi.org/10.1016/j.ces.2013.01.036

[P15] **Dietrich, N**., Mayoufi, N., Poncin, S., Midoux, N., Li, H.Z., 2013. Bubble formation at an orifice: A multiscale investigation. Chem. Eng. Sci. 92, 118–125. https://doi.org/10.1016/j.ces.2012.12.033

[P16] Jimenez, M., **Dietrich, N.,** Grace, J.R., Hébrard, G., 2014. Oxygen mass transfer and hydrodynamic behaviour in wastewater: determination of local impact of surfactants by visualization techniques. Water Res. 58, 111–121. https://doi.org/10.1016/j.watres.2014.03.065

[P17] Frank, X., **Dietrich, N**., Li, H.Z., 2014. A damping phenomenon in viscoelastic fluids. EPL Europhys. Lett. 105, 54006. https://doi.org/10.1209/0295-5075/105/54006

[P18] Lekhlif, B., Kherbeche, A., Hebrard, G., **Dietrich, N**., Echaabi, J., 2015. Influence of initial glycerol concentration upon bacterial cells adaptability and biodegradation kinetics on a submerged aerated fixed bed reactor using Biocell®(PE05) packing. Afr. J. Environ. Sci. Technol. 9, 71–79

[P19] **Dietrich, N.,** Francois, J., Jimenez, M., Cockx, A., Guiraud, P., Hébrard, G., 2015. Fast Measurements of the Gas-Liquid Diffusion Coefficient in the Gaussian Wake of a Spherical Bubble. Chem. Eng. Technol. 38, 941–946. https://doi.org/10.1002/ceat.201400471

[P20] Tatin, R., Moura, L., **Dietrich, N**., Baig, S., Hébrard, G., 2015. Physical Absorption Of Volatile Organic Compounds By Spraying Emulsion In A Spray Tower: Experiments And Modelling. Chem. Eng. Res. Des., 104, 409-415.

[P21] Yang, L., **Dietrich, N**., Loubière, K., Gourdon, C., Hébrard, G., 2016. Visualization And Characterization Of Gas-Liquid Mass Transfer Around A Taylor Bubble Right After The Formation Stage In Microreactors. Chem. Eng. Sci. https://doi.org/10.1016/j.ces.2016.01.013

[P22] Bouayed, N., **Dietrich, N**., Lafforgue, C., Lee, C.-H., Guigui, C., 2016. Process-Oriented Review of Bacterial Quorum Quenching for Membrane Biofouling Mitigation in Membrane Bioreactors (MBRs). Membranes 6. https://doi.org/10.3390/membranes6040052

[P23] Yang, L., **Dietrich, N.,** Hébrard, G., Loubière, K., Gourdon, C., 2017. Optical methods to investigate the enhancement factor of an oxygen-sensitive colorimetric reaction using microreactors. AIChE J. 63, 2272–2284. https://doi.org/10.1002/aic.15547

[P24] Hariz, R., del Rio Sanz, J.I., Mercier, C., Valentin, R., **Dietrich, N**., Mouloungui, Z., Hébrard, G., 2017. Absorption of toluene by vegetable oil–water emulsion in scrubbing tower: Experiments and modelling. Chem. Eng. Sci., 157, 264–271. https://doi.org/10.1016/j.ces.2016.06.008

[P25] Xu, F., Jimenez, M., **Dietrich, N**., Hébrard, G., 2017. Fast determination of gas-liquid diffusion coefficient by an innovative double approach. Chem. Eng. Sci., 170, 68–76. https://doi.org/10.1016/j.ces.2017.02.043

[P26] Benizri, D., **Dietrich, N.,** Hébrard, G., 2017. Experimental characterization of multi-component absorption in complex liquid: New method and apparatus. Chem. Eng. Sci., 170, 116–121. https://doi.org/10.1016/j.ces.2017.03.024

[P27] Yang, L., Loubière, K., **Dietrich, N**., Le Men, C., Gourdon, C., Hébrard, G., 2017. Local investigations on the gas-liquid mass transfer around Taylor bubbles flowing in a meandering millimetric square channel. Chem. Eng. Sci. 165, 192–203. https://doi.org/10.1016/j.ces.2017.03.007

[P28] Kherbeche, A., Nsakou, S.N., Lekhlif, B., Hébrard, G., **Dietrich, N**., 2017. Study of the initial glycerol concentration effects upon bacterial cells' adaptation and biodegradation kinetics on a submerged aerated fixed bed reactor using Biocell® packing. Journal of Materials and Environmental Sciences, 8, 9, 3280-3289

[P29] C. W. Zhao, C. Gentric, **N. Dietrich**, Y. Ma, H. Z. Li, 2017, Deformation of liquid-liquid interfaces by a rotating rod, Physics of Fluids 29, 072108, doi: http://dx.doi.org/10.1063/1.4995476

[P30] Wongwailikhit, K., Warunyuwong, P., Chawaloesphonsiya, N., **Dietrich, N.,** Hébrard, G., Painmanakul, P., Gas Sparger Orifice Sizes and Solid Particle Characteristics in a Bubble Column – Relative Effect on Hydrodynamics and Mass Transfer. Chem. Eng. Technol. 2018. https://doi.org/10.1002/ceat.201700293

[P31] X. Xie, **N.Dietrich**, C.Lemen, P.Schmitz, L. Filaudeau et A. Line., 2018, Local Hydrodynamic Investigation within a Dynamic Filtration Unit under Laminar Flow, Chemical Engineering Research and Design, https://doi.org/10.1016/j.cherd.2018.02.018

[P32] **N. Dietrich** & G. Hébrard, Visualization of gas-liquid mass transfer around a rising bubble using an oxygen sensitive dye, Heat and Mass Transfer, 2018, 54: 2163. https://doi.org/10.1007/s00231-018-2297-3

[P33] **N. Dietrich**, Escape Classroom: The Leblanc Process – An Educational "Escape Game" to Illustrate the Origins of Chemical Engineering, Journal of Chemical Education, 2018, 95 (6), pp 996–999. https://doi.org/10.1021/acs.jchemed.7b00690

[P34] Xu, F.; Cockx, A.; Hébrard, G.; Dietrich, N. Mass Transfer and Diffusion of a Single Bubble Rising in Polymer Solutions. Ind. Eng. Chem. Res. 2018, 57 (44), 15181–15194. https://doi.org/10.1021/acs.iecr.8b03617

[P35] Xie, X., Le Men, C., **Dietrich, N**., Schmitz, P., Fillaudeau, L., 2018. Local hydrodynamic investigation by PIV and CFD within a Dynamic filtration unit under laminar flow. Sep. Purif. Technol. 2018, https://doi.org/10.1016/j.seppur.2017.04.009

[P36] Ahmia, A. C., Idouhar, M., Wongwailikit, K., **Dietrich, N**., & Hébrard, G. (2019). Impact of Cellulose and Surfactants on Mass Transfer of Bubble Columns. Chemical Engineering & Technology, 42(11), 2465–2475. https://doi.org/10.1002/ceat.201800620

[P37] Benizri, D., **Dietrich, N**., Labeyrie, P., & Hébrard, G. (2019). A compact, economic scrubber to improve farm biogas upgrading systems. Separation and Purification Technology, 219, 169–179. 3.927. https://doi.org/10.1016/j.seppur.2019.02.054

[P38] **Dietrich, N.** (2019). Chem and Roll: A Roll and Write Game To Illustrate Chemical Engineering and the Contact Process. Journal of Chemical Education, 96(6), 1194–1198. https://doi.org/10.1021/acs.jchemed.8b00742

[P39] **Dietrich, N.,** Wongwailikhit, K., Mei, M., Xu, F., Felis, F., Kherbeche, A., Hébrard, G., & Loubière, K. (2019). Using the "Red Bottle" Experiment for the Visualization and the Fast Characterization of Gas–Liquid Mass Transfer. Journal of Chemical Education, 96(5), 979–984. https://doi.org/10.1021/acs.jchemed.8b00898

[P40] Felis, F., Strassl, F., Laurini, L., **Dietrich, N.,** Billet, A.-M., Roig, V., Herres-Pawlis, S., & Loubière, K. (2019). Using a bio-inspired copper complex to investigate reactive mass transfer around an oxygen bubble rising freely in a thin-gap cell. Chemical Engineering Science, 207, 1256–1269. https://doi.org/10.1016/j.ces.2019.07.045

[P41] Wongwailikhit, K., **Dietrich, N.,** Hébrard, G., & Painmanakul, P. (2019). Performance of a Monofiber Optical Probe in Determining the Droplet Size and Velocity in Spray Systems Compared with a High-Speed Camera. Industrial & Engineering Chemistry Research, 58(51), 23366–23379. https://doi.org/10.1021/acs.iecr.9b02446

[P42] Xie, X., Andre, C., **Dietrich, N.,** Schmitz, P., & Fillaudeau, L. (2019). Flow investigation in an innovating dynamic filtration module using tracing methods. Separation and Purification Technology, 227, 115656. https://doi.org/10.1016/j.seppur.2019.05.098

[P43] Xu, F., Midoux, N., Li, H.-Z., Hébrard, G., & **Dietrich, N**. (2019). Characterization of Bubble Shapes in Non-Newtonian Fluids by Parametric Equations. Chemical Engineering & Technology, 42(11), 2321–2330. https://doi.org/10.1002/ceat.201800690

[P44] Bouayed, N., Cavalier, A., Lafforgue, C., **Dietrich, N.,** Lee, C.-H., & Guigui, C. (2020). Hydrodynamics Characterization of the Impact of Free-Moving Particles in an Air-Lift Membrane Bioreactor. Industrial & Engineering Chemistry Research, 59(16), 7943–7954. https://doi.org/10.1021/acs.iecr.9b06749

[P45] Coudret, C., & **Dietrich, N.** (2020). Fun with Flags and Chemistry. Journal of Chemical Education, 97(12), 4377–4384. https://doi.org/10.1021/acs.jchemed.0c00514

[P46] Estudante, A., & **Dietrich, N**. (2020). Using Augmented Reality to Stimulate Students and Diffuse Escape Game Activities to Larger Audiences. Journal of Chemical Education. https://doi.org/10.1021/acs.jchemed.9b00933

[P47] Kherbeche, A., Mei, M., Thoraval, M.-J., Hébrard, G., & **Dietrich, N**. (2020). Hydrodynamics and gas-liquid mass transfer around a confined sliding bubble. Chemical Engineering Journal, 386, 121461. https://doi.org/10.1016/j.cej.2019.04.041

[P48] Monnot, M., Laborie, S., Hébrard, G., & **Dietrich, N**. (2020). New approaches to adapt escape game activities to large audience in Chemical Engineering: Numeric supports and students' participation. Education for Chemical Engineers. https://doi.org/10.1016/j.ece.2020.05.007

[P49] Xu, F., Hébrard, G., & **Dietrich, N**. (2020). Comparison of three different techniques for gas-liquid mass transfer visualization. International Journal of Heat and Mass Transfer, 150, 119261. https://doi.org/10.1016/j.ijheatmasstransfer.2019.119261

[P50] Canado, A., Tournois, M., Pages, M., Roustan, M., Remus-Borel, W., **Dietrich, N**., Violleau, F., & Hébrard, G. (2020). Sudden Decrease of the Dissolved Ozone Concentration in Sprays: A Mass Transfer Phenomenon? Industrial & Engineering Chemistry Research, 59(33), 14914–14924. https://doi.org/10.1021/acs.iecr.0c03216

[P51] **Dietrich, N.,** Kentheswaran, K., Ahmadi, A., Teychené, J., Bessière, Y., Alfenore, S., Laborie, S., Bastoul, D., Loubière, K., Guigui, C., Sperandio, M., Barna, L., Paul, E., Cabassud, C., Liné, A., & Hébrard, G. (2020). Attempts, Successes, and Failures of Distance Learning in the Time of COVID-19. Journal of Chemical Education. https://doi.org/10.1021/acs.jchemed.0c00717

[P52] Mei, M., Hébrard, G., **Dietrich, N.,** & Loubière, K. (2020). Gas-liquid mass transfer around Taylor bubbles flowing in a long, in-plane, spiral-shaped milli-reactor. Chemical Engineering Science, 222, 115717. https://doi.org/10.1016/j.ces.2020.115717

[P53] Mei Mei, Felis, F., Hébrard, G., **Dietrich, N.,** & Loubière, K. (2020). Hydrodynamics of Gas–Liquid Slug Flows in a Long In-Plane Spiral Shaped Milli-Reactor. Theoretical Foundations of Chemical Engineering, 54(1), 25–47. https://doi.org/10.1134/S0040579520010169

[P54] A.-L. Aymard, J. Teychené, S. Laborie, M. Bertrand, & **N. Dietrich**, Tournament Battle: Gamifying Bibliographic Research and Oral Argumentation Applied to Chemical Engineering Topics, J. Chem. Educ., vol. 98, no. 9, pp. 2937–2943, Sep. 2021, https://doi.org/10.1021/acs.jchemed.1c00458

[P55] **N. Dietrich**, M. Jimenez, M. Souto, A. W. Harrison, C. Coudret, and E. Olmos, "Using Pop-Culture to Engage Students in the Classroom," J. Chem. Educ., vol. 98, no. 3, pp. 896–906, Mar. 2021, doi: https://doi.org/10.1021/acs.jchemed.0c00233

[P56] G. Lebrun, F. Xu, C. Le Men, G. Hébrard, & **N. Dietrich**, "Gas–Liquid Mass Transfer around a Rising Bubble: Combined Effect of Rheology and Surfactant," Fluids, vol. 6, no. 2, Art. no. 2, Feb. 2021, doi: https://doi.org/10.3390/fluids6020084

[P57] G. Lebrun, S. Benaissa, C. Le Men, V. Pimienta, G. Hébrard, & **N. Dietrich**, "Effect of surfactant lengths on gas-liquid oxygen mass transfer from a single rising bubble," Chemical Engineering Science, vol. 247, p. 117102, Jan. 2022, https://doi.org/10.1016/j.ces.2021.117102

[P58] **Dietrich, N**.; Lebrun, G.; Kentheswaran, K.; Monnot, M.; Loulergue, P.; Franklin, C.; Teddé-Zambelli, F.; Djouadi, C.; Leveneur, S.; Tourbin, M.; Bessière, Y.; Coufort-Saudejaud, C.; Couvert, A.; Schaer, E. Rebalancing the Historical Female Underrepresentation in Education. J. Chem. Educ. 2022, 99 (6), 2298–2309. https://doi.org/10.1021/acs.jchemed.1c01218

[P59] Lebrun, G.; El Mokdad, B.; Le Men, C.; Pimienta, V.; Coudret, C.; Roux, C.; Hébrard, G.; **Dietrich, N.** Luminescent Probe Synthesis for Oxygen Visualization Technique: Application to the Effect of Surfactant Structure on Oxygen Mass Transfer. Chem. Eng. Sci. 2022, 260, 117921. https://doi.org/10.1016/j.ces.2022.117921

[P60] Canado, A.; Lemen, C.; Pages, M.; Violleau, F.; **Dietrich, N**.; Hébrard, G. Gas-Liquid Mass Transfer Characterization in a Thin Shrinking Film at an Atomization Nozzle. Int. J. Heat Mass Transf. 2022, 189, 122672. https://doi.org/10.1016/j.ijheatmasstransfer.2022.122672

[P61] Mei, M.; Le Men, C.; Loubière, K.; Hébrard, G.; **Dietrich, N**. Taylor Bubble Formation and Flowing in a Straight Millimetric Channel with a Cross-Junction Inlet Geometry. Part I: Bubble Dynamics. Chem. Eng. Sci. 2022, 255, 117609. https://doi.org/10.1016/j.ces.2022.117609

[P62] Mei, M.; Le Men, C.; Loubière, K.; Hébrard, G.; **Dietrich, N**. Taylor Bubble Formation and Flowing in a Straight Millimetric Channel with a Cross-Junction Inlet Geometry Part II: Gas-Liquid Mass Transfer. Chem. Eng. Sci. 2022, 117752

[P63] Wantz, E.; Benizri, D.; **Dietrich, N.;** Hébrard, G. Rate-Based Modeling Approach for High Pressure Water Scrubbing with Unsteady Gas Flowrate and Multicomponent Absorption Applied to Biogas Upgrading. Appl. Energy 2022, 312, 118754

[P64] Kalyani Kentheswaran, **Nicolas Dietrich**, Sébastien Tanguy & Benjamin Lalanne, Direct numerical simulation of gas-liquid mass transfer around a spherical contaminated bubble in the stagnant-cap regime, International Journal on Heat & Mass Transfer, Accepted, 2022.

SCAN ME

The integrality of the full texts of my scientific articles are available in "open access" on the national archive HAL: https://cv.archives-ouvertes.fr/nicolas-dietrich

The number of peer-reviewed papers and citations per year is reported in Figure 1.

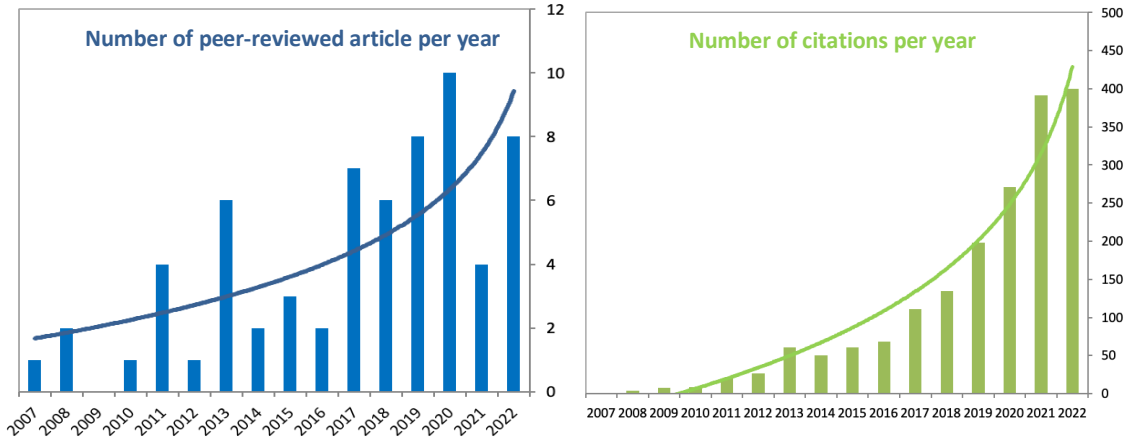

Figure 1: Evolution of the number of peer reviewed publications per year, and evolution of the number of citations per year (source Google Scholar, October 2022).

- Publications in other scientific journals (French journals): **7**

[NP1] **Nicolas Dietrich**, Poncin Souhila, Li Huai-Zhi, Passage of a Bubble through a liquid-liquid interface, Récents Progrès en Génie des Procédés, Numéro 96 – 2007, ISBN 2-910239-70-5, Ed. SFGP, Paris, France.

[NP2] **Nicolas Dietrich,** Poncin Souhila, Li Huai-Zhi, Dynamique des bulles dans un micro-réacteur, Récents Progrès en Génie des Procédés, Numéro 95 – 2007, ISBN 2-910239-69-1, Ed. SFGP, Paris, France.

[NP3] Jessica François, **Nicolas Dietrich**, Arnaud Cockx, Champs d'oxygène dans le sillage d'une bulle par µ-PLIF : Oxygen spots in a bubble wake by µ-PLIF, Récents Progrès en Génie des Procédés, Numéro 101 – 2011, ISSN 1775-335X – ISBN 2-910239-75-6, Ed. SFGP, Paris, France

[NP4] Mélanie Jimenez, **Nicolas Dietrich**, Gilles Hébrard, Direct measurement of diffusion coefficient by PLIF Récents Progrès en Génie des Procédés, Numéro 101 – 2011, ISSN 1775-335X – ISBN 2-910239-75-6, Ed. SFGP, Paris, France

[NP5] Jimenez Mélanie, **Dietrich Nicolas**, Hebrard Gilles, Etude de la diffusion de l'oxygène dans des milieux liquides au travers d'une interface plane par PLIF, Récents Progrès en Génie des Procédés, Numéro 104 – 2013, ISBN: 1775-335X ; ISBN: 978-2-910239-78-7, Ed. SFGP, Paris, France.

[NP6] Mélanie Jimenez, Marianne Lebigaut, **Nicolas Dietrich**, Arnaud Cockx, Gilles Hébrard, Etude du transfert de matière gaz-liquide autour d'une bulle par inhibition de fluorescence, Récents Progrès en Génie des Procédés, Numéro 104 – 2013, ISBN: 1775-335X ; ISBN: 978-2-910239-78-7, Ed. SFGP, Paris, France.

[NP7] Benizri David, **Nicolas Dietrich**, Kaës Sylvie, Labeyrie Pierre et Hebrard Gilles, Biogas Upgrade By Water Scrubbing To Improve Farm Biogas Plant, Récents Progrès en Génie des Procédés, Numéro 104 – 2013, ISBN: 1775-335X ; ISBN: 978-2-910239-78-7, Ed. SFGP, Paris, France.

- Invited lectures & Keynote lectures: **17**

I1. **Nicolas Dietrich,** Gas/Liquid mass transfer in Technicolor. Invited Speaker. University of Brithish Columbia, Vancouver, Canada, April 2012.

I2. **Nicolas Dietrich**, Optical Techniques to Evaluate Hydrodynamics and Mass Transfer in Biorectors, novembre 2015, Seoul National University, Korea

I3. **Nicolas Dietrich**, M. Jimenez, A. Cockx, A. Dani., P. Guiraud & G. Hebrard, Etude du transfert de matière par Inhibition de Fluorescence (PLIFI) aux interfaces gaz-liquide, 34ème Journée Thématique de l'AFVL, Mesures Laser en écoulement en présence d'interfaces gaz-liquide, 14 November 2013, CNRS Bellevue- Meudon, Conférence plénière/Keynote lecture.

I4. **Nicolas Dietrich**, Optical Techniques to Evaluate Hydrodynamics and Mass Transfer in Biorectors, International Workshop on MBR/Quorum Quenching-MBR, 19th November, 2015, Seoul National University, Korea

I5. Karine Loubière, Lixia Yang & **Nicolas Dietrich**, Use of a colorimetric technique based on an oxygen-sensitive dye to measure Gas-liquid mass transfer around bubbles flowing in millimetric channels, Franco-German seminar 'Gas-Liquid Flows', Toulouse, 8-10 June 2016.

I6. **Nicolas Dietrich**, Gas-liquid mass transfer visualization around free rising bubbles by fluorescence quenching: review and focus on FERMaT-TUUH contributions, Franco-German seminar 'Gas-Liquid Flows', Toulouse, 8-10 June 2016, Keynote lecture.

I7. **N. Dietrich** & Anne-Marie Billet. Bubbly flows in FERMaT: research activities, tools and applications. 2nd International Workshop Non-Invasive Experimental Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, June 2018, Hamburg, Germany 〈hal-01826983〉

I8. Loubière, Yang, **N. Dietrich,** Gourdon & Hébrard, Gas-liquid mass transfer around Taylor bubbles flowing in a meandering millimetric square channel, 2nd International Workshop Non-Invasive Experimental Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, June 2018, Hamburg, Germany

I9. **N. Dietrich**, M. Jimenez, M. Mei, L. Yang, F. Felis, F. Xu, K. Loubière & G. Hébrard, Visualization of gas-liquid mass transfer around bubbles, Xi'an Jiatong University, Meeting Room 2, School of Aerospace, October 16th 2018, China

I10. **Nicolas Dietrich**, Visualization of gas-liquid mass transfer around bubbles: a local approach, Institute of Technology of Cambodia, Octobre 2019, Phnom Penh, Cambodge

I11. Gaëlle Lebrun, Feishi Xu, Gilles Hebrard & **Nicolas Dietrich,** Transfert de matière gaz/liquide d'une bulle en ascension dans un liquide complexe en présence de de tensioactifs, Keynote of the 17th congress of Société Française de Génie des Procédés (SFGP), Nantes, 15-17 October 2019

I12. **Nicolas Dietrich**, Mélanie Jimenez, Christophe Coudret & Eric Olmos, Using Pop-Culture to Engage Students in Chemical Engineering & Chemistry: Practicing the 21st century skills, Séminaire formation – pédagogie 2021, AgroParisTech, Paris Saclay – 5 juillet 2021.

I13. G. Hébrard, **N. Dietrich**, G. Lebrun, M. Mei, F. Xu, A. Canado, C. Le Men & K. Loubière, Visualization of gas-liquid mass transfer around bubbles & droplets, Seminar of the SFB/TRR

287 BULK-REACTION programm, Otto von Guericke University Magdeburg: OVGU, Invited webinar presentation, 1st June, 2021.

I14. Karine Loubière, Anne-Marie Billet, **Nicolas Dietrich**, Reactive mass transfer and deposit in the wake of confined bubbles, EFCE Spotlight Talks, 20 Mai 2021, Invited webinar presentation.

I15. **Dietrich Nicolas,** Monnot Mathias, Laborie Stephanie, Hébrard Gilles, Anne-Laure Aymar, Johanne Teychené, Mickaël Bertrand, Anabela Estudante, Mélanie Jimenez, Manuel Souto, Aaron Harrison, Christophe Coudret & Eric Olmos, Gamification & engaging activities in Chemical Engineering: Investigating tools for tackling Education 4.0, European Federation of Chemical Engineering – Working party Education, 18 May 2021, Invited presentation – webinar

I16. **Dietrich Nicolas,** Visualization of gas-liquid mass transfer around bubbles**,** Université Paul Sabatier-IMRCP, May 2022, Invited presentation

I17. **Dietrich Nicolas,** "Mesure du transfert de matière gaz-liquide par colorimétrie à l'échelle microfluidique/millifluidique", Journée Thématique : Techniques optiques pour des applications milli- ou micro-fluidiques, 6 October 2022, ICA, Toulouse, Invited presentation

I18. **Dietrich Nicolas** & Katja Auffret**,** "L'apprentissage par le Challenge", La semaine de la pédagogie, INSA Toulouse, 2 Septembre 2022

I19. **Dietrich Nicolas** & Katja Auffret**,** "Challenge Thinking : l'apprentissage par le Challenge", Les mardi de la pédagogie (hybride), INSA Toulouse, 6 Décembre 2022

I20. **Dietrich Nicolas,** Challenge Thinking: Challenge based Learning as a first step toward innovation in education, Boosting Innovation and Entrepreneurship through European Universities, Annual seminar, Toulouse, 24th November 2022

- Conferences and communications: **70**

C1. **Nicolas Dietrich**, Souhila Poncin and Huai-Zhi Li, (Oral presentation), Passage of a Bubble through a liquid-liquid interface, 11ème congrès de la société française de génie des procédés, SFGP07, October 2007, St-Etienne, France.

C2. Xavier Frank, **Nicolas Dietrich**, Jing Wu, Renaud Barraud and Huai-Zhi Li, (Oral presentation), Bubble nucleation and growth in fluids, 8th International conference on Gas-Liquid and gas-liquid-solid reactor, GLS08, December 2007, New Delhi, India.

C3. **Nicolas Dietrich**, C. Zhao, X. Franck S. Poncin, N. Midoux and H.-.i Li, (Oral presentation), Etude de l'effet Weissenberg microscopique par μ-PIV, 18ème congrès français de mécanique, CFM07, August 2007, Grenoble, France.

C4. **Nicolas Dietrich**, Souhila Poncin and Huai-Zhi Li, (Poster presentation), Dynamique des bulles dans un microréacteur, 5èmes journées francophones sur les réacteurs gaz-liquide et gaz-liquide-solide, GLS05, June 2007, Carry-le-Rouet, France

C5. **Nicolas Dietrich**, Souhila Poncin and Huai-Zhi Li (Oral presentation), Multi-scale approach of Bubble Formation by PIV and μ-PIV, 18th International Congress of Chemical and Process Engineering, CHISA2008, August 2008, Prague, Czech Republic.

C6. **Nicolas Dietrich**, Souhila Poncin and Huai-Zhi Li (Poster presentation), Liquid-liquid coating: Passage of bubbles and spheres through Interfaces, 18th International Congress of Chemical and Process Engineering, CHISA2008, August 2008, Prague, Czech Republic.

C7. **Nicolas Dietrich**, Souhila Poncin and Huai-Zhi Li, (Oral presentation), Experimental Investigation of Bubble Formation in Micro-Devices, Symposium on process intensification and miniaturisation, CHISA2008, August 2008, Prague, Czech Republic.

C8. **Nicolas Dietrich**, Poncin Souhila, Li Huai-Zhi, (Poster presentation), Étude de la déformation d'interfaces : Etude de l'hydrodynamique dans une « Lava Lamp », Seminar of R.P.2.E. doctoral school (Ressource Procédés Produit et Environnement). Nancy, France, January 2008. Prize for best poster of the seminar.

C9. **Nicolas Dietrich**, Souhila Poncin, and Huai-Zhi LI, (Oral presentation), Bubble formation in T-Y junction micro-mixers: A quick microreactor design tool, 2nd European microdfluidic conference, December 2010, Toulouse,

C10. Mélanie Jimenez, **Nicolas Dietrich,** Gilles Hébrard, Direct measurement of diffusion coefficient by PLIF, SFGP 2011, December 2011, Lille, France

C11. Jessica Francois, **Nicolas Dietrich**, Pascal Guiraud, Arnaud Cockx, (Oral presentation), Direct measurement of mass transfer around a single bubble by micro-PLIFI GLS10, June 2011, Braga Portugal

C12. Mélanie Jimenez, **Nicolas Dietrich**, Gilles Hébrard, (Poster presentation), Direct measurement of diffusion coefficient by PLIF, GLS10, June 2011, Braga Portugal.

C13. **Nicolas Dietrich**, Souhila Poncin, Noel Midoux and Huai-Zhi Li, (P poster presentation), Bubbles formation under a shear flow: experimental studies with PIV characterization, GLS10, June 2011, Braga Portugal.

C14. M. Jimenez, M. Le Bigaut, **N. Dietrich**, G. Hébrard, Visualization of oxygen concentration fields in the wake of bubbles by planar laser induced fluorescence, 15th International Symposium on Flow Visualization, June 25-28, 2012, Minsk, Belarus.

C15. M. Jimenez, **N. Dietrich**, G. Hébrard, Visualization of a pure diffusive phenomenon at a planar gas/liquid interface by planar laser induced fluorescence, 15th International Symposium on Flow Visualization, June 25-28, 2012, Minsk, Belarus

C16. Mélanie Jimenez, Marianne Lebigaut, **Nicolas Dietrich**, Arnaud Cockx, Gilles Hébrard ; (Oral presentation), Etude du transfert de matiere gaz-liquide autour d'une bulle par inhibition de fluorescence, 6èmes Journées Francophones sur les Réacteurs Gaz – Liquide et Gaz – Liquide – Solide GLS-FR6, 8 to 11 May 2012 – Marrakesh (Morocco)

C17. Jimenez Mélanie, **Dietrich Nicolas**, Hebrard Gilles (Oral presentation), Etude de la diffusion de l'oxgene dans des milieux liquides au travers d'une interface plane par plif 6èmes Journées Francophones sur les Réacteurs Gaz – Liquide et Gaz – Liquide – Solide GLS-FR6, 8 to 11 May 2012 – Marrakesh (Morocco)

C18. Pang Haoran, Letisse Valérie, Paul Etienne, **Dietrich Nicolas,** Hébrard Gilles. Poster, Caractérisation hydrodynamique d'un nouveau garnissage, le Béton Brique, dans deux types de lits bactériens ruisselants, 6èmes Journées Francophones sur les Réacteurs Gaz – Liquide et Gaz – Liquide – Solide GLS-FR6, 8 to 11 May 2012 – Marrakesh (Morocco)

C19. Abderrahmane Kherbeche, James Milnes, **Nicolas Dietrich**, Gilles Hebrard, Brahim Lekhlif, Poster, Etude multi-échelle de l'hydrodynamique et transfert de matière d'un système tri-phasique appliqué en traitement des eaux,6èmes Journées Francophones sur les Réacteurs Gaz – Liquide et Gaz – Liquide – Solide GLS-FR6, 8 to 11 May 2012 – Marrakesh (Morocco)

C20. Aldo Padilla, Héctor Galleguillos, **Nicolas Dietrich,** Coated-bubble generation by co-extrusion, Procemin 2012. 20-23 November 2012. Sheraton Hotel and Convention Center, Santiago, Chile

C21. M. Jimenez, **Nicolas Dietrich** and G. Hébrard, "Mass transfer in the wake of non-spherical air bubbles quantified by quenching of fuorescence", GLS11, Seoul, Korea, August 2013.

C22. Abderramanne Kerbeche, James Milnes, **Nicolas Dietrich**, Gilles Hebrard, Brahim Lekhlif, Multi-scale experimental study of the influence of physicochemical parameters on the hydrodynamic and gas-liquid mass transfer in biofilters, International Symposium "Environnement, Catalyse et Génie des Procédés" (ECGP'11), Villeneuve d'Ascq (France), 26-28 June 2013.

C23. **Nicolas Dietrich**, K. Loubière, M. Jimenez, G. Hébrard And C. Gourdon, "A new direct technique for visualizing and measuring gas liquid mass transfer around bubbles moving in a straight millimetric square channel", GLS11, Seoul, Korea, August 2013.

C24. Kherbeche A., J. Milnes, M. Jimenez, **Nicolas Dietrich**, G. Hébrard and B. Lekhlif, "Multi scale analysis of the influence of physicochemical parameters on the hydrodynamic and gas/liquid mass transfer in gas/liquid/solid reactors", GLS11, Seoul, Korea, August 2013

C25. R. Tatin, **Nicolas Dietrich**, L. Moura, S. Baig and G. HÉBRARD, "Physical absorption of volatile organic compounds by spraying emulsion in an innovative spray tower", 9th World Congress of Chemical Engineering 2013, August 18-23, 2013 / Coex, Seoul, Korea.

C26. D.Benizri, **Nicolas Dietrich**, S.Kaës, P.Labeyrie and G.Hebrard, "Biogas upgrade by water scrubbing to improve farm biogas plant", 9th World Congress of Chemical Engineering 2013, August 18-23, 2013 / Coex, Seoul, Korea.

C27. Benizri David, **Nicolas Dietrich**, Kaës Sylvie, Labeyrie Pierre and Hebrard Gilles, Biogas Upgrade By Water Scrubbing To Improve Farm Biogas Plant, Congrès de la Société Française de Génie des Procédés SFGP 2013, Lyon, October 2013.

C28. Jimenez Mélanie, **Nicolas Dietrich**, and Hébrard Gilles, Quand les lasers nous éclairent sur le transfert de matière gaz/liquide dans les eaux usées, Congrès de la Société Française de Génie des Procédés SFGP 2013, Lyon, October 2013.

C29. R. Tatin, **N. Dietrich**, L. Moura, G. Hebrard, Physical absorption of volatile organic compounds by spraying emulsion in an innovative spray tower, Congrès de la Société Française de Génie des Procédés SFGP 2013, Lyon, October 2013

C30. Nicolas Lesage, **Nicolas Dietrich**, Gilles Hébrard, Reduction of The Volatile Organic Compounds Emission In Api Tanks By Spreading A Thin Liquid Layer Protection, 5th IWA Specialized Conference on Odours and Air Emissions. Held jointly with 10th Conference on Biofiltration for Air Pollution Control, 4-7 March 2013, San Francisco, California, USA

C31. David Benizri, Hébrard Gilles, **Nicolas Dietrich**, Pierre Labeyrie, Biogas upgrading by water scrubbing to improve Farm biogas plant, 4th International congress on Green Process Engineering, 7-10 April 2014; Seville,

C32. Xiaomin Xie, Philippe Schmitz, **Nicolas Dietrich,** Luc Fillaudeau, Investigation of Velocity Field (By Particle Image Velocimetry) In Turbulent Flow Regime Within A Dynamic Filtration Module, ECCE10 / Nice, 2015

C33. David Benizri, **Nicolas Dietrich**, Aras Ahmadi, Gilles Hébrard, Ligia Barna, Life Cycle Analysis Of An Innovative Scrubber For Biogas Upgrading Processed At Farm Scale, ECCE10 / Nice, 2015

C34. Lixia Yang Karine Loubière, **Nicolas Dietrich**, Christophe Gourdon and Gilles Hébrard, An innovative colorimetric technique for measuring gas-liquid mass transfer around bubbles moving in meandering millimetric square channels, Microfluidics: from laboratory tools to process development, Rueil-Malmaison, France, 4-5 November 2015

C35. G.Hebrard, **Nicolas Dietrich**, R.Hariz, R.Valentin, Z.Mouloungui, Absorption of toluene per a vegetable Oil-Water emulsion in scrubbing tower: Experiments and Modeling. 12th international conference on gas-liquid and gas-liquid-solid reactor engineering, New York, June 2015.

C36. G.Hebrard, L.Yang, **Nicolas Dietrich**, K.Loubiere, C.Gourdon, Visualization of Gas-Liquid mass transfer around a Taylor bubble during the forming stage and the flowing stage in microreactor. 12th international conference on gas-liquid and gas-liquid-solid reactor engineering, New York, June 2015.

C37. D.Benizri, G.Hebrard, **Nicolas Dietrich**, P.Labeyrie, Biogas upgrading at farm scale: improvements of absorption in water scrubbers. 12th international conference on gas-liquid and gas-liquid-solid reactor engineering, New York, June 2015.

C38. Xiaomin XIE, **Nicolas Dietrich**, Philippe Scmitz, Luc Filleaudeau, Laminar Flow In A RVF Dynamic Filtration Unit: From Global To Local Hydrodynamic Approach, 12th Word Filtration Congress, April 11-15 2016 Taipei, Taiwan

C39. Xiaomin Xie, Youssef El Rayess, Yannick Manon, Nicolas Jitariouk, Claire Albasi, Martine Mietton-Peuchot, Audrey Devatine, Philippe Schmitz, **Nicolas Dietrich** and Luc Fillaudeau, Wine Clarification With Rotating And Vibrating Filtration (Rvf): From Wine – Membrane Interactions Up To Critical Frequency Identification, 12th Word Filtration Congress, April 11-15 2016 Taipei, Taiwan

C40. Naïla Bouayed, Anthony Cavalier, **Nicolas Dietrich**, Christine Lafforgue, Chung-Hak Lee, Christelle Guigui, Hydrodynamics characterization of free-moving particles in a gas-liquid-solid QQ-MBR, International Water Industry Conference 2016 – Water – Energy – Health Nexus, 18~21 October 2016, EXCO, Daegu, Korea

C41. Abderramanne Kerbeche, James Milnes, **Nicolas Dietrich**, Gilles Hebrard, Brahim Lekhlif, Bubble rising in a 2D packed-cell: Mass transfer quantification, International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), Oral presentation, Brussels, Belgium, August 2017

C42. Kritchart Wongwailikhit, Passaworn Warunyuwong, Nattawin Chawaloesphonsiya, **Nicolas Dietrich,** Gilles Hébrard and Pisut Painmanakul, Comparative study of a spray with optical probe and high-speed camera, 13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), oral presentation, Brussels, Belgium, August 2017

C43. X. Xie, C. Lemen, **N. Dietrich**, L. Fillaudeau, P. Schmitz, A. Liné, Local Hydrodynamic Investigation by PIV within a Dynamic Filtration Unit under Laminar Flow, International Symposium on Mixing in Industrial Processes IX, Oral presentation, Hyatt Regency Birmingham, 25-28th June 2017

C44. N. Bouayed, **Nicolas Dietrich**, Christine Lafforgue-Baldas, Chung-Hak Lee, Christelle Guigui, Hydrodynamics characterization of free-moving particles in a Gas-Liquid-Solid Membrane Bio-Reactor (GLS-MBR) ,13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), poster presentation, Brussels, Belgium, August 2017

C45. Benizri, D., **Dietrich, N**., Hébrard, G., Experimental characterization of multi-component absorption in complex liquid: new method and apparatus, 13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), oral presentation, Brussels, Belgium, August 2017

C46. X. Xie, Christophe Andre, **Nicolas Dietrich**, Philippe Schmitz, Luc Fillaudeau, (Poster presentation), Investigation and modeling of Residence Time Distribution and thermal dissipation in a Dynamic Filtration module, 30th SFGP, July 11-13th, 2017, Nancy, France

C47. F. Xu, **Nicolas Dietrich** and Gilles Hébrard, Visualization of mass transfer around rising bubble in non-Newtonian fluids, 13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), oral presentation, Brussels, Belgium, August 2017

C48. Feishi Xu, **Nicolas Dietrich** and Gilles Hébrard, Fast determination of gas-liquid diffusion coefficient by an innovative double approach, 13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), oral presentation, Brussels, Belgium, August 2017

C49. Lixia Yang; Karine Loubiere, **Nicolas Dietrich,** Claude Le Men; Christophe Gourdon, Gilles Hébrard, New Insights On The Gas-Liquid Mass Transfer Around Taylor Bubbles Flowing In A Meandering Millimetric Square Channel, 13th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-13), oral presentation, Brussels, Belgium, August 2017

C50. F. Xu, **N. Dietrich,** A. Cockx, C. Le Men and G. Hébrard, Comparison of three different visualization techniques for local mass transfer characterization around single bubble rising in water, 19th International Symposium on the Application of Laser and Imaging Techniques to Fluid Mechanics, July 16 – 19, 2018, Lisbon, Portugal

C51. F. Felis, **N. Dietrich,** A. -M. Billet, F. Strassl, S. Herres-Pawlis, V. Roig and K. Loubière, Experiments on reactive mass transfer around an oxygen bubble rising freely in a confined cell using colourimetric methods, 19th International Symposium on the Application of Laser and Imaging Techniques to Fluid Mechanics, July 16 – 19, 2018, Lisbon, Portugal

C52. Felis F., **Dietrich N**., Billet A-M, Herres-Pawlis S., Strassl F., Roig V., Loubière K. (2018), Experimental study of reactive mass transfer around a bubble rising in a confined cell, Symposium SHF Dispersed two-phase flows 2018, 17-19 September 2018, Toulouse, France

C53. Felis F., **Dietrich N**., Billet A-M, Herres-Pawlis S., Strassl F., Roig V., Loubière K. (2018), Reactive mass transfer around an oxygen bubble rising freely in a confined cell, 2nd International Workshop Non-Invasive Experimental Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, June 2018, Hamburg, Germany.

C54. Felis F., **Dietrich N**., Billet A-M, Herres-Pawlis S., Strassl F., Roig V., Loubière K. (2018), Mass transfer in Hele-Shaw cell: experimental and numerical studies. 2nd International Workshop Non-Invasive Experimental Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, June 2018, Hamburg, Germany

C55. Xu, **Dietrich,** Cockx, Lemen, Hébrard, Comparison of three different visualization techniques for local mass transfer characterization around single bubble rising in water, 2nd International Workshop Non-Invasive Experimental Tools and Numerical Methods for the Investigation of Non-Reactive and Reactive Gas-Liquid Flows, June 2018, Hamburg, Germany

C56. M. Mei, **N. Dietrich,** G. Hébrard and K. Loubière, Investigations of gas-liquid mass transfer around Taylor bubbles flowing in a long in-plane spiral-shaped milli-reactor, Second International Process Intensification Conference, 2019, Louvain, Belgium

C57. Abderrahmane Kherbeche, Mei Mei, Marie-Jean Thoraval, Gilles Hébrard, **Nicolas Dietrich**, Hydrodynamics Visualization and Gas-Liquid Mass Transfer Quantification of a Sliding Bubble, 14th International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering (GLS-14), 2019, Guilin, China,

C58. M. Mei, **N. Dietrich**, G. Hébrard and K. Loubière, Local Visualization and Investigation on Gas-Liquid Mass Transfer around Taylor Bubbles Flowing in an In-Plane Spiral-Shaped Millireactor, 14th International Conference on Gas-Liquid and Gas-Liquid-Solid Reactor Engineering (GLS-14), Guilin, China, May 30-June 3 2019,

C59. Bouayed, N., **Dietrich, N.,** Lafforgue, C., Lee, C.-H., Guigui, C., Quorum Quenching in MBR: Mass transfer and hydrodynamic characterization, 9th International Water Association (IWA) Membrane Technology Conference & Exhibition for Water and Wastewater Treatment and Reuse (IWA-MTC 2019), Toulouse, France, 23-27 June 2019.

C60. Gaëlle Lebrun, Gilles Hébrard & **Nicolas Dietrich,** Effect of surfactant adsorption on velocity and oxygen transfer of a single bubble rising in a liquid, poster presentation, the 12th European Congress of Chemical Engineering, Florence 15-19 Septembre 2019.

C61. **N. Dietrich,** M. Monnot, S. Laborie et G. Hebrard, Escape-game Pédagogique et Génie des Procédés : le casse-tête de l'adaptation à grande échelle, XVIIème Congrès de la Société Française de Génie des Procédés (SFGP), oral presentation, Nantes, 15 -17 Octobre 2019

C62. Canado A., Pages M., Tournois M., Demeneghi S. Mylena, Roustan Michel, Remus-Borel Wilfried, **Dietrich N.,** Hebrard G., Violleau F., Ozone mass transfer in spraying column: modeling both absorption and desorption, International Ozone Association, 24th World Congress & Exposition, Nice, 20-25 octobre 2019

C63. Lebrun G., Hébrard G., et **Dietrich N**. Effect of surfactant chain length on oxygen transfer in bubbly flow. Présenté au 24e International Congress of Chemical and Process Engineering (CHISA), mars 2021.

C64. Raphael Kullis, Cécile Formosa, Alexandra Ter Hall, **Nicolas Dietrich**, Christophe Coudret, Photoactive nanocomposite particles powered in the Near-InfraRed, 28th IUPAC Symposium on Photochemistry, 17th-22nd July 2022, Amsterdam

C65. J. Teychene, E. Mideksa, A. Tourette Diallo, **N. Dietrich**, C. Guigui, Mise en œuvre du Quorum Quenching pour limiter la communication bactérienne intervenant dans les bioréacteurs à membrane, MemPro, oral presentation, 15-17 juin 2022, ENSCM Montpellier

C66. Wantz, Eliot; Benizri, David; **Dietrich, Nicolas**; Hébrard, Gilles, Épuration du biogaz à la ferme pour la valorisation simultanée de bio-CH4 et de bio-CO2, SFGP Nov. 2022, Oral presentation, Toulouse

C67. Mideska Ermias, Bouayed, Naila, Tourrette Audrey, Lafforgue-Baldas Christine, **Dietrich Nicolas**, Teychene Johanne, Guigui, Christelle, Quorum Quenching pour limiter le colmatage membranaire dans les bioréacteurs : quels apports du génie des procédés, SFGP 2022, Nov. Toulouse Keynote

C68. **Nicolas Dietrich**, Challenge-Based Learning pedagogy applied to Sustainable Chemical Engineering: a first attempt at INSA Toulouse, Unlock conference 2022 Nov., Oral presentation

C69. M. Mei, C. Le Men, K. Loubière, Gilles Hébrard & **Nicolas Dietrich**, Gas-Liquid Mass Transfer Around a Taylor Bubble during the Formation and Flowing Stage in a Square Flow-Focusing Milli-Channel, 15th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-15), 7-10 Agust 2022, Ottawa, Oral presentation

C70. E. Wantz, D. Benizri, **N. Dietrich**, G. Hébrard, Gas-Liquid Cylindrical Cyclone (GLCC) as a flash separator to improve methane recovery in HPWS for biogas upgrading, 15th International Conference on Gas–Liquid and Gas–Liquid–Solid Reactor Engineering (GLS-15), 7-10 Agust 2022, Ottawa, Oral presentation

C71. Implementation of Quorum Quenching to limit bacterial communication in membrane bioreactors, EMS 40th Anniversary, 20-24 November- Sorrento (Naples, Italy, E.Mideska, J.Teychene, A.Tourrette, V.Sartor, C.Claparols, **N.Dietrich,** C.Guigui, Oral presentation

- Patents: **6**

B1. US Patent 8,756,982, **N. Dietrich** and H.-Z. Li, Patent for "micro-tensiomètrie interfaciale".

B2. EP Patent 2,483,660 **N. Dietrich** and H.-Z. Li, Patent for "micro-tensiomètrie interfaciale".

B3. WO Patent 2,011,039,461 **N.Dietrich** and H.-Z. Li, Patent for "micro-tensiomètrie interfaciale".

B4. FR 2992007 Chatillon Laurent ; Cockx Arnaud ; **Nicolas Dietrich,** Gourdon Christophe.; Hebrard Gilles; Loubiere Karine.; Prat Laurent. n°1255626- FR 2992007 (A1) - Dispositif a paroi de coloration variable et procédé de coloration d'une paroi.

B5. FR 1451934 - Gilles Hébrard, David Benizri, **Nicolas Dietrich**, Pierre Labeyrie, "Dispositif de séparation de constituants gazeux contenus dans un mélange gazeux, et son utilisation pour la séparation de méthane et de dioxyde de carbone", 10/03/2014, N° FR 1451934.

B6. FR I-21-2483 Axel CANADO, Gilles HEBRARD, Marielle PAGES, Nicolas DIETRICH, Michel ROUSTAN, «c Buses spécifiques de pulvérisation d'eau ozonée pour le traitement optimal des cultures » **(under review)**

DESCRIPTION OF THEACHING ACTIVITIES, EDUCATIONAL AND ADMINISTRATIVE RESPONSABILITIES

In France: Home institution (number of teaching hours – calculated as equivalent to 1 hour of practical tutorials): since my nomination in 2009 as an associate professor, most of my teaching activities have been at INSA Toulouse in the Department of Chemical Engineering and Environment. My teaching is grouped around 4 themes:

- Heat and mass transfer (3rd and 4th year of engineering degree),
- Fluid mechanics (3rd year engineering and Master of Science),
- Unit operations for Chemical Engineering, Water engineering and Environment (3rd, 4th and 5th year engineers),
- Design and architecture of industrial processes (3rd year engineering and Master of Science).

The full details of my teaching activities in the last 5 years are given in Table 1.

Topic	Level and language	Type	Hours in the last 5 years
Heat and mass transfer phenomena	3rd and 4th years of engineering degree **In French**	**Tutorials**: gas-liquid mass transfer, thermal transfer and industrial exchangers **Practical work:** transfer of material to bubble column and moistened disc **Creation** of a practical project: "bubble column" and participation in the rehabilitation of other practical work.	~ 200 hours
Fluid mechanics	3rd year of engineering degree **In French**	**Practical work**: turbulence, anemometry, flow measurements, mixing, wind tunnel. **Writing** of a practical work booklet.	~ 200 hours
Chemical engineering (Unit operations, reactor engineering & design and architecture of industrial process)	3rd, 4th and 5th years of engineering degree **In French**	**Classes:** architecture and design in chemical engineering, advanced process for water treatment. **Tutorials:** distillation, process flow sheeting, macroscopic balances **Practical work:** distillation, extraction, absorption **Creation** of courses (20 h of lectures and 15 h of tutorials), writing of three practical work booklets, **renovation** of practical work in "distribution of residence times" and several slideshows, **creation** of active and innovative pedagogy sessions (by project, by video capsules, organization of "battle" activity and "escape game" to increase student stimulation).	~ 300 hours
Chemical engineering (Unit operation, mass balance, reactor engineering) **Initiation to research by project**	M1 Master of science **In English to international students**	**Classes and tutorials**: Introduction to chemical engineering, architecture and design in chemical engineering, mass balance with chemical reaction, fluid mechanics and visualization techniques. **Creation** of the architecture of the full first semester of the master's degree, **setting up** of course units (50 h) in chemical engineering and fluid mechanics, **writing** of four booklets in English for classes and practical work, and several slideshows, **design and setting up** of new practical work in microfluidics, **creation** of new courses related to experimental techniques developed in research, **creation** of a research initiation project.	~ 300 hours
TOTAL ~ 1000 hours + 250 hours for discharge of institutional duties (Time Equivalent Referential REH – INSA Toulouse)			

Table 1. Synthesis of teaching activities in the last 5 years (1 hour = 1 hour of tutorial)

- In other institutions : nothing to report

In other countries: During the last five years, I have paid several visits to international universities (Germany, Canada, Scotland, Thailand, China, Korea) to promote the international program of the University of Toulouse. I have met the heads of the international offices of these universities and given

several conferences to students about studies in France. I have participated in the China Education Exhibit in Beijing, Shanghai and Canton several times, to meet and interview numerous students interested in access to one of the 7 Master of Science programs I have promoted. I have participated in several "n+i" network, "French embassy" and "campus France" events in China to discuss the cooperation program between France and China with local authorities. I participated in the development of a Memorandum of Understanding (MOU) between Chinese universities in Tianjin and Xi'an and INSA Toulouse. I also negotiated the contract with the enrolment agency in China and developed the international communication of the international Master of Science of Toulouse (dedicated website, flyer, videos, etc.).

Educational and administrative responsibilities during the last 5 years

2021– today	Expert of the "Challenge-Bases Learning" approach for the INSA Group (8 engineering schools in France).
2015 – today	Head of the Master of Science in "Complex System Engineering" of University of Toulouse, INSA Toulouse, INP Toulouse, IMT Mines d'Albi, (2-year program, 480 ECTS credits, 50 students per year), Toulouse and Albi, France
2015 – today	Co-head of the Master degree "Fluid Engineering for Industrial processes", (2-year program, 120 ECTS credits, 30 students per year), INSA Toulouse & INP Toulouse, France
2015 – 2022	Head of the 4th year of the engineering course in "Chemical Engineering and Environment" (60 ECTS credits, 50 students per year), INSA Toulouse, France

Upon my arrival at INSA Toulouse 2009, I was involved in specific programs for international students, including a Master of Science "Fluid Mechanics for Industrial Processes" which I co-led with Eric Climent (INPT). Following the habilitation application in 2012 and accreditation application that we led in 2015, I have been **responsible for this program** at INSA since 2013 (flow of 25 students per year for the two years of training). I am in charge of recruiting students via the various portals ("n+I" network, campus France, ToulouseTech portal and direct messaging), I make promotion missions in Asia (1 to 2 weeks per year), welcome students on their arrival, reserve their accommodations, organize their registrations, organize and plan the full first semester, I manage all the internship agreements of the two years of the master's degree, participate in and organize the validation/graduation juries of M1 and M2 and co-organize the graduation ceremony. As part of this responsibility, I have the right to a discharge of 24 hours / year included in the Time Equivalent Referential (REH) of INSA Toulouse. Since 2015, I am **also referent of the section** "Engineering of Complex Systems" **Master's degree,** which groups together 4 different international master courses. This task of coordination is more an administrative task: animation and synthesis of the official documents of the section (convention, accreditation application, HCERES synthesis etc.). Since 2015, I am also the **supervisor of the 4th year** of engineering training at the "Chemical Engineering and Environments" (GPE) department at INSA Toulouse (flow of 50 students per year, REH of 30 hours/year). This responsibility includes drawing up the schedules of the two full semesters, organizing the open day, several events between students and the department, and the pedagogical assessments, and ensuring the link with students concerning pedagogical problems. In 2020, I participated in several trainings on pedagogies at the interface of teaching and research within the European alliance of which INSA Toulouse is a part - ECIU University (https://www.eciu.org). I became the **expert for the INSA group** of the Challenge-Based Learning (CBL) approach and I launched several European challenges within ECIU (societal theme - multicultural and interdisciplinary student team with an external partner coming from society).

BOARD & COMMITTEE RESPONSIBILITIES

2022 – 2026	Elected member of the Education Board of the university, INSA Toulouse, France
2018 – 2022	Elected member of the Scientific Board of the university, INSA Toulouse, France
2015 – 2021	Elected member of the recruitment committee of the Chem. Eng. Department Board, INSA Toulouse, France
2015 – 2018	Elected member of the University Board, INSA Toulouse, France
2015 – 2018	Member of the Disciplinary Board, INSA Toulouse, France
2015 – 2018	Member of the Financial Board, INSA Toulouse, France
2015 – 2016	Elected member of the Chemical Engineering Department Board, INSA Toulouse, France

OTHER RESPONSIBILITIES

- Responsible for the practical work platform "Chemical Engineering and Environment" at INSA (2011-2015),
- Responsible for several teaching units at INSA Toulouse (since 2012): management of teachers, declaration of hours worked in teaching, pedagogical animation, juries.
- I participate in laboratory or department visits for special promotion occasions (open days) or in the annual interviews of admissions to the first and third year at INSA Toulouse.

PHD SUPERVISION

PHD SUPERVISION	ENTIRE CAREER	LAST 5 YEARS
NUMBER OF SUPERVISED THESES (COMPLETED)	20	12
NUMBER OF SUPERVISED ONGOING THESES	3	-

15 PhD supervisions in France: Mélanie Jimenez (2010-2013), Abderhamane Kherbeche (2012-2015), David Benizri (2013-2016), Xiaomin Xie (2013-2017), Lixia Yang (2013-2017), Naila Bouyaed (2014-2017), Feishi Xu (2015-2019), Kritchart Wongwailikhit (2016-2019), Mei Mei (2017-2021), Gaelle Lebrun (2018-2021), Kalyani Kentheswaran (2018-2022), Axel Canado (2018-2022), Eliot Wantz (2019-2023) & Alexis Bages (2022-2025)

5 PhD international PhD students hosted in the laboratory for collaborations: Aldo Padilla (2012 – 3 months - Chile), David Mikaelian (2012 – 1 month – Belgium), Ly Tran (2013 – 5 months – Vietnam), Aida Ahmia Cherifa (2016 – 8 months - Algeria) & Alexandra Buess (2018 – 1 month, Belgium)

9 post-doctoral & research engineers: Jessica François (2010-2011), Benjamin Boulbène (2012), Loic Letner (2014), Francisco Felis (2017-2018) & Abdheramane Kherbeche (2018), Raphaelle Kullis (2020/2021), Gaelle Lebrun (2020/2021), Kalyani Kentheswaran (2022-2023) and Hanbin Shi (2022-2023)

34 Master of Science supervisions: Amélie Pouplin (2006), Laurent Richard (2007), Silvia Pheulpin (2007), Nadia Mayoufi (2008), Elodie Magné (2008), Amélie Michelle (2008), Junwei Qian (2009), Augusto Alejandro García Ciniselli (2010), Oussama Harrathi (2010), Oscar Conesa-Palacios (2011), Maria Perez (2011), James Milnes (2012), Bounab El Hadi (2012), Maria Guadalupe Navarrete Tapia (2012), Erij ben Slimene (2013), Mike Turnock (2013), Cristina López Martínez (2013), José Ignacio Del Rio Sanz (2014), Lorena Moura (2014), Victor Sousa (2014), Rania Hariz (2015), P. Samanta (2016), Anthony Cavalier (2016), R. N. Mancheno (2017), J.C. Molina Choque (2017), Mohammed Farhat (2018), Masakusa Sugiyama (2018) & Carinna Hoppe (2019), Sanae Benaissa (2020), Bilal El Mokdad (2020), Mohamaed Madani (2020), Rashad Daou (2022), Rami Jaed (2022) & Issam Abdallah (2022).

5 Technical staff: Christophe Ellero (Mechanics 2020), Claude Le Men (Optic 2020-2021), Nathalie Clergerie (Chemistry – 2020-), Abdlali Khalfaoui (Mechanics 2020-), Guillaume Chareyre (2022-)