

Joen Hermans

Post-doc researcher | oil paint chemistry



contact

vd Boschstraat 5bis
3531 GK Utrecht
the Netherlands

+31 (0) 642295489

joenhermans@gmail.com

www.joenhermans.nl

Creative interdisciplinary scientist with a strong background in chemistry

Independent researcher with a broad range of analytical skills. Extensive experience in leading projects aimed at tackling complex research questions in an interdisciplinary environment. Passionate science communicator and teacher.

research

- 2017—now **Post-doc researcher** Rijksmuseum Amsterdam
- Collaboration with prof. S. Woutersen (University of Amsterdam)
 - Development of 2D-IR spectroscopy methods for (model) oil paint systems
 - Co-supervision of PhD student
- 2012–2017 **PhD in chemistry, *cum laude*** University of Amsterdam
- Thesis: *Metal soaps in oil paints: Structure, mechanisms and dynamics*
- Supervision by prof. P. D. Ledema and dr. K. Keune
 - Characterisation of the chemical pathway of metal soap formation in oil paint
 - Extensive international collaboration with conservators and researchers
 - Supervised 7 student projects, taught 3 lab courses, gave numerous guest lectures

education

- 2010–2012 **Master in Nanomaterials: Chemistry & Physics, *cum laude*** Utrecht University
- Thesis: *Cluster formation in deionized dispersions of hollow silica cubes*
- Thesis supervision by prof. A. P. Philipse
 - Focus on physical, analytical and colloid chemistry
 - Internship at Technical University Delft with prof. J. van Esch, on molecular dissipative self-assembling systems
- 2007–2010 **Bachelor in Chemistry, *cum laude*** Utrecht University
- Broad basis in organic, inorganic, physical and analytical chemistry, both in theory and practice
 - Exchange semester at Universitetet i Bergen, Norway (neurochemistry, quantum mechanics, physical chemistry)

awards

- 2017 National finalist in the FameLab science communication competition (for video (3 min.) of the finals pitch, click on vimeo.com/222185070).
- 2012 Shortlisted for the 'Vliegenthart Scriptieprijs', for best Master's thesis written at Utrecht University.
- 2007 Ranked 6th in the National Final of the International Chemistry Olympiad.
- 2007 Winner of the 'Diligentiaprijs voor Scholieren', for best high school science graduate.

academic activities

- **Reviewer** | I have reviewed **8** manuscripts between mid-2015 and end-2017 for the journals *Microscopy & Microanalysis*, *Microchemical Journal*, *ACS Applied Materials & Interfaces*, *RSC Advances* and the Springer book *Metal Soaps in Art* (in press).
- **Speaker** | I have delivered numerous popular science lectures about the chemistry of oil paintings at student symposia, the InScience film festival, high schools, international meetings with museum professionals, and gave **7** talks as guest lecturer for analytical chemistry students.
- **Editor and writer** | I worked for the popular science magazine *Amsterdam Science* for 2 years.
- **International collaboration** | I have collaborated with scientists from the Australian Centre for Microscopy & Microanalysis, CNRS institute IPANEMA (France) and the Royal Institute of Technology (Sweden) on the development of synchrotron and electron microscopy experiments for oil paint research. All projects lead to one or more co-authored publications.
- **Education development (high school)** | At the Rijksmuseum, I work on the development of teaching materials for high schools to use the chemistry of museum objects to teach fundamental chemical concepts.
- **Education development (university)** | Both during my M.Sc. and Ph.D. studies, I developed laboratory course material for undergraduate students, and wrote student manuals for analytical instruments.
- **Teaching** | Extensive teaching experience: from tutoring high school students in mathematics, physics and chemistry, teaching lab courses to undergraduate students as a master's student and PhD candidate, to supervising **7** BSc and MSc thesis projects.

Conferences

- *speaker* **CHAINS** Veldhoven, the Netherlands, 2017.
- *invited speaker* **Science4Arts Symposium** Amsterdam, the Netherlands, 2016.
- *speaker* **Erasmus-Descartes Conference/Young Talent Meeting: Cultural Heritage and Innovation** Paris, France, 2016.
- *poster/participant* **Gordon Research Conference: Scientific Methods in Cultural Heritage Research** Newry, USA, 2016.
- *invited speaker/discussion leader* **International Metal Soaps in Art Symposium** Amsterdam, the Netherlands, 2016.
- *speaker* **ICOM-CC Triennial Conference** Melbourne, Australia, 2014.
- *speaker* **Chemistry for Cultural Heritage** Vienna, Austria, 2014.

skills

Analytical: ATR-FTIR, XRD, DSC, 2D-IR spectroscopy, (IR)-microscopy, GC-MS, HPLC, AAS, UV-vis, NMR, CV, SAXS, XANES **Computer:** Mathematica, \LaTeX , Microsoft Office, Adobe Illustrator, Linux **Languages:** Dutch (native), English (fluent), German (basic), French (basic)

selected publications

Since 2014, I have (co-)authored **15** peer-reviewed publications. A selection of the most relevant papers is given below.

- *Time-dependent ATR-FTIR studies on fatty acid diffusion and the formation of metal soaps in oil paint model systems*
Baij, L.,* **Hermans, J. J.*** (* equal contribution), Keune, K., Iedema, P. D. (2018). *Angewandte Chemie*. Accepted. doi.org/10.1002/ange.201712751
- *Electron microscopy imaging of zinc soap nucleation in oil paint*
Hermans, J. J., van Loon, A., Iedema, P. D., Osmond, G., Webb, R., Drennan, J., Jack, K., Rasch, R., Morgan, G., Zhang, Z., Monteiro, M. & Keune, K. (2018). *Microscopy & Microanalysis*. Accepted.
- *Towards a molecular model for the formation of metal soaps in oil paints*
Hermans, J. J., Keune, K., van Loon, A. & Iedema, P. D. (2018). In F. Casadio et al. (Eds.), *Metal Soaps in Art: Conservation & Research*, Springer. In press.
- *Time-resolved ATR-FTIR studies on the release of solvents from cleaning gels into model systems of oil paint binding media*
Baij, L., Keune, K., **Hermans, J. J.**, Noble, P., & Iedema, P. D. (2017). In B. Ormsby, J. H. Townsend & R. H. Wolbers (Eds.), *Gels in the Conservation of Art*, Archetype Publications.
- *Ionomer-like structure in mature oil paint binding media.*
Hermans, J. J., Keune, K., van Loon, A., Corkery, R. W. & Iedema, P. D. (2016). *RSC Advances*, 6, 93663–93369. doi.org/10.1039/c6ra18267d
- *The crystallization of metal soaps and fatty acids in oil paint model systems*
Hermans, J. J., Keune, K., van Loon, A., & Iedema, P. D. (2016). *Physical Chemistry Chemical Physics*, 18, 10896–10905. doi.org/10.1039/C6CP00487C
- *Random graph approach to multifunctional molecular networks*
Kryven, I., Duivenvoorden, J., **Hermans, J. J.** & Iedema, P. D. (2016). *Macromolecular Theory and Simulations*, 25, 449–465. doi.org/10.1002/mats.201600052
- *An infrared spectroscopic study of the nature of zinc carboxylates in oil paintings*
Hermans, J. J., Keune, K., van Loon, A. & Iedema, P. D. (2015). *Journal of Analytical Atomic Spectrometry*, 30, 1600–1608. doi.org/10.1039/C5JA00120J
- *The molecular structure of three types of long-chain zinc(II) alkanoates for the study of oil paint degradation*
Hermans, J. J., Keune, K., van Loon, A., Corkery, R. W. & Iedema, P. D. (2014). *Polyhedron*, 81, 335–340. doi.org/10.1016/j.poly.2014.06.030

interests

professional: Designing experimental methods, teaching and supervision, problem solving, optimising data analysis, science communication.

personal: cycling, acoustic guitar playing, bouldering, philosophy of science, reading, hiking and camping in the mountains of Norway, and travelling elsewhere.