

CURRICULUM VITAE

Diederik Sybolt Wiersma



Languages English, Dutch, Italian, German, French.

Academic Qualifications

31 August 1991 Graduation (master's) Cum Laude at the Univ. of Amsterdam, Faculty of Physics

21 November 1995 PhD experimental physics, FOM-Institute for Atomic and Molecular Physics.

Current Position

Nov 2013 – today **Full professor** (*professore ordinario*), *Dipartimento di Fisica, Univ. di Firenze*.

Jun 2016 – today **President** *Istituto Nazionale di Ricerca Metrologica – INRIM, Torino*.

Previous Positions

Jan 1996 – Nov 1999 **Marie Curie research fellow** at the LENS in Florence

Dec 1999 – Dec 2002 **Researcher** National Institute for the Physics of Matter (INFM, Genova)

Dec 2002 – Dec 2006 **Assistant research director** (primo ricercatore) CNR-INO

Jan 2007 – Nov 2013 **Research director** (*direttore di ricerca*) CNR-INO

Nov 2010 – Nov 2013 **Director** of the European Laboratory for Non-linear Spectroscopy (LENS) in *Firenze*.

Additional professional duties

Member of the **board of directors** of the faculty of physics, University of Amsterdam (1990-1991).

Head of the national interdepartmental CNR platform on photonics (2010-2012).

Head micro-nano photonics, European Laboratory for Non-linear Spectroscopy (2011 - today).

Member of the **board of directors** of the Italian Liquid Crystal Society (2007-2013).

Co-founder of the Nanophotonics Europe association (since 2008).

Italian representative in the scientific panel of physics, chemistry, and mathematics of **Science Europe**.

Member of the **Regional Innovation Hub on Renewable Energies** PIERRE (2010-2016)

Editor/member editorial board The Physical Review A (2009-2014), Advanced Optical Materials (WILEY, 2013-today), Euro Physics Letters (2014-today).

BIBLIOGRAPHIC REFERENCES AND INDICES

Total number of **scientific citations** (ISI Web of Knowledge, 2021): **13971**

Average number of citations per paper: **58**

H-index (Web of Science): **54**

(has published under different names: D. Wiersma, D.S. Wiersma, and D.A. Wiersma)

More than 200 **invited keynote and plenary presentations** at international conferences and renowned universities world-wide.

SCIENTIFIC EVALUATION

Panel member evaluation of **Marie Skłodowska-Curie** Innovative Training Networks (since 2016).

Panel member of **ERC** starting grant panel PE2 (2013).

Panel chair of **ERC** consolidator grant panel PE2 (2015 – 2020).

Panel member of **ERC** synergy grant panel (since 2021).

Vice-chair for the European Commission's Horizon Europe Widening participation and strengthening the European Research Area program (since 2021).

Member of the **Scientific Advisory Board** Spanish Consolider program "NanoLight" (2008-2012).

Member of the **Scientific Advisory Board** of the ICON Foundation (2012-2016).

Frequent **referee** of Nature, Nature Physics/Photonics/Materials, and The Physical Review Letters.

Regular **reviewer for scientific programs**, including those of the Israel Science Foundation (ISF), Swiss National Foundation for Scientific Research (Bern, Schweiz), Department of Energy of the United States Government, European Science Foundation (Eurocores program), Italian Ministry of Education and University, and the French National Research Agency (ANR).

SUMMARY OF SCIENTIFIC ACTIVITY AND TECHNOLOGY TRANSFER

Known for his creative pioneering-style research while at the same time capable of bringing research results to the level of applications useful for society. Testimony of this is the large number of publications in high impact journals as Nature and Science, (including a substantial amount of cover stories), while at the same time having a consistent patent portfolio and having been actively involved in technology transfer.

His work is often of interdisciplinary nature, involving concepts of photonics, solid state physics and atomic physics, but also chemistry and engineering. In particular, D.W. is known worldwide for his work in disordered photonics, a field that he pioneered and co-founded. Other important breakthroughs he obtained are in the field of high precision nano scale imaging and nano scale realization of materials and their characterization. He recently started a new research direction, thanks to an ERC Advanced research grant, by combining nano scale fabrication with elastic materials and photonics. The project includes the synthesis and patterning of liquid crystalline elastomers and their formation into optically active components, and opens the road towards light driven robotics, actuators, and biological (human body) compatible photonic devices.

Of his team's results, 19 were published as cover stories, including Nature (2x), PRL (2x), Physics Today, Nature Photonics (3x), Nature Materials, Advanced Materials (7x), Light Science & Applications (2x).



International Awards

2004 Ugo Campisano award of the National Institute for the Physics of Matter (INFM)

2014 National Academy of Sciences award “Premio Tartufari” for physics (handed out by the president of state Giorgio Napolitano)

2015 Enrico Fermi award for physics (Italian Physical Society)

Selected scientific contributions

- Significantly contributed to the development of the field of disordered photonics. Pioneering work on multiple scattering of light and lasing in amplifying disordered materials. Introduction in literature of the – now widely used – terminology *random laser*.
- Observation and study of Lévy flights and super-diffusion of photons in a new material called Lévy glass. These results are strongly interdisciplinary and have implications in economy (stock market), life sciences (human travel, animal foraging), and geophysics (pollution spreading).
- Realization of a nano-infiltration system to create re-writable optical circuits and tunable photonic structures and components.
- Observation and understanding of several optical analogies of solid state phenomena, like optical Bloch oscillations, Zener tunneling of light, critical localization in quasi-crystals, and optical NTC resistance. Observation of Anderson localization in 2D systems and subsequent application for efficient thin film solar cells.
- First realization of light driven micrometer scale soft robots and soft micro-actuators (e.g. microscopic hand powered by light). New method for micro patterning of elastomers and realization of tunable optical components by optical deformation elastomers.
- Development of a new technology for super-resolution spectroscopy using a random laser as light source.
- Development of bio-compatible photonic devices, including a prototype cardiac assist device using optically active polymer.

Project management and coordination (selection)

- Coordinator of the INFM project *Tunable Random Lasers for New Light Sources* 346 kEuro (2002 – 2003).
- INFM project *GaAs-based photonic crystals* 322 kEuro (2002 – 2004).
- National project on *Silicon Based Photonic Crystals* 310 kEuro (2002 – 2007).
- National project on *New Nanophotonic Devices*, Ente Cassa di Risparmio di Firenze 450 kEuro (2008-2009).
- Deputy coordinator of the European network of excellence on nanophotonics *Phoremest* 4.7 MEuro (total) 450 kEuro (local) (2004 - 2008).
- Industrial contract ENI Italy on nano photonic structures for efficient solar cells 150 kEuro (2009-2011).
- European network of excellence on nanophotonics for energy efficiency 2.7 MEuro (total) 300 kEuro (local) (2009 – 2012).
- Seed project on smart materials funded by the Italian Institute of Technology 630 kEuro (2009-2011).
- Advanced ERC grant on Nano photonic Micro Robotics 2.2 MEuro (2012-2018).
- Laserlab Europe – Joint Research Activity *Photonic Materials* 150 kEuro (2015-2019).
- Industrial grant Mettler-Toledo on *photonics for gas sensing* 120 kEuro (2019-2020).

- Deputy Coordinator European FET-open project on *Photonic and Atomic Bio-Sensing* 2.5 MEuro (total) 500 kEuro (local) (2019-2024).
- National Project of 'Particular Strategic Relevance' (FISR) *MicroRNA and Smart Patches for the Treatment of Acute or Chronic Myocardium Infarction* 1.3 MEuro (total) 514 kEuro (local) (2021 – 2022).

Selected publications

- D.S. Wiersma, P. Bartolini, A. Lagendijk, and R. Righini, *Localization of light in a disordered medium*, **Nature** 390, 671 (1997).
- D.S. Wiersma and S. Cavaleri, *A temperature-tunable random laser*, **Nature** 414, 708 (2001).
- Ledermann, L. Cademartiri, M. Hermatschweiler, C. Toninelli, G.A. Ozin, D.S. Wiersma, M. Wegener, and G. von Freymann, *Three-dimensional silicon inverse photonic quasicrystals for infrared wavelengths*, **Nature Materials** 5, 942 (2006).
- A.C. Arsenault, T.J. Clark, G. von Freymann, L. Cademartiri, R. Sapienza, J. Bertolotti, E. Vekris, S. Wong, V. Kitaev, I. Manners, R.Z. Wang, S. John, D.S. Wiersma, and G.A. Ozin, *From colour fingerprinting to the control of photoluminescence in elastic photonic crystals*, **Nature Materials** 5, 179 (2006).
- P. Barthelemy, M. Ghulinyan, Z. Gaburro, C. Toninelli, L. Pavesi, and D.S. Wiersma, *Optical switching by capillary condensation*, **Nature Photonics** 1, 172 (2007).
- S. Gottardo, R. Sapienza, P.D. García, A. Blanco, D.S. Wiersma, and C. López, *Resonance-driven random lasing*, **Nature Photonics** 2, 429 (2008).
- P. Barthelemy, J. Bertolotti, and D.S. Wiersma, *A Lévy flight for light*, **Nature** 453, 427 (2008).
- D.S. Wiersma, *The Physics and Applications of Random Lasers*, **Nature Physics** 4, 359 (2008).
- L. Mahler, A. Tredicucci, F. Beltram, C. Walther, J. Faist, H.E. Beere, D.A. Ritchie, D.S. Wiersma, *Quasi-periodic distributed feedback laser*, **Nature Photonics** 4, 165 (2010).
- K. Vynck, M. Burrelli, F. Riboli, and D.S. Wiersma, *Photon management in two-dimensional disordered media*, **Nature Materials** 11, 1017 (2012).
- W. Bao, M. Melli, N. Caselli, F. Riboli, D.S. Wiersma, M. Staffaroni, H. Choo, D.F. Ogletree, S. Aloni, J. Bokor, S. Cabrini, F. Intonti, M.B. Salmeron, E. Yablonovitch, P.J. Schuck, and A. Weber-Bargioni, *Mapping local charge recombination heterogeneity by multidimensional nanospectroscopic imaging*, **Science** 338, 1317 (2012).
- D.S. Wiersma, *Disordered Photonics*, **Nature Photonics** 7, 188 (2013).
- F. Riboli, N. Caselli, S. Vignolini, F. Intonti, K. Vynck, P. Barthelemy, A. Gerardino, L. Balet, L.H. Li, A. Fiore, M. Gurioli, and D.S. Wiersma, *Engineering of light confinement in strongly scattering disordered media*, **Nature Materials** 13, 720 (2014).
- S. Palagi, A.G. Mark, S.Y. Reigh, K. Melde, T. Qiu, H. Zeng, C. Parmeggiani, D. Martella, A. Castillo, N. Kapernaum, F. Giesselmann, D.S. Wiersma, E. Lauga, P. Fischer, *Structured light enables biomimetic swimming and versatile locomotion of photo-responsive soft microrobots*, **Nature Materials** 15, 647 (2016).
- B. Fazio, A. Irrera, S. Pirotta, C. D'Andrea, S. Del Sorbo, M.J. Lo Faro, P.G. Gucciardi, M.A. Iatì, R. Saija, M. Patrini, P. Musumeci, C.S. Vasi, D.S. Wiersma, M. Galli, F. Priolo, *Coherent backscattering of Raman light*, **Nature Photonics** 11, 170 (2017).
- A. Boschetti, A. Taschin, P. Bartolini, A.K. Tiwari, L. Pattelli, R. Torre, D.S. Wiersma, *Spectral super-resolution spectroscopy using a random laser*, **Nature Photonics** 14, 177 (2020).
- M. Leonetti, L. Pattelli, S. de Panfilis, D.S. Wiersma, G. Ruocco, *Spatial coherence of light inside three-dimensional media*, **Nature Comm.** 12, 4199 (2021).

Invited “News and Views” papers and commentaries

- D.S. Wiersma, M.P. van Albada, and A. Lagendijk, *Random Laser*, **Nature** 373, 203 (1995).
- D.S. Wiersma, J.G. Rivas, P. Bartolini, A. Lagendijk, and R. Righini, *Localization or classical diffusion of light*, **Nature** 398, 207 (1999) (answer).
- D.S. Wiersma, *Laser Physics: The smallest random laser*, **Nature** 406, 132 (2000).
- D.S. Wiersma, *Controlling photons with light*, **Nature Photonics** 2, 136 (2008).
- D.S. Wiersma, *Optics: Light reined in*, **Nature** 452, 942 (2008).
- D.S. Wiersma, *Random Lasers Explained*, **Nature Photonics** 3, 246 (2009).
- D.S. Wiersma, *Random Quantum Networks*, **Science** 327, 1333 (2010).
- D.S. Wiersma, *Disordered Optics: Resonant dust*, **Nature Photonics** 4, 274 (2010).
- D.S. Wiersma, *Light transport: breaking reciprocity*, **Nature Phot.** 6, 506 (2012).
- F Scheffold and D Wiersma, *Inelastic scattering puts in question recent claims of Anderson localization of light*, **Nature Photonics** 7 (12), 934-934 (2013) (comment).
- D.S. Wiersma, *Clear Directions for Random Lasers*, **Nature** 539, 360 (2016).
- D.S. Wiersma, B.A. van Tiggelen & A. Lagendijk, *In memory of Philip W. Anderson*, **Nature Phot.** 14, 401 (2020) (obituary).

International patents (PCT and WO)

- D.S. Wiersma, S. Vignolini, V. Türck, F. Intonti, Procedure for the realization of rewritable photonic circuits, Italian patent n. TO2006A000216 (2006), PCT extension IB2007/050989 (2007), and US Patent 12/293, 185 (2009).
- D. S. Wiersma, F. Riboli, K. Vynck, M. Burrese, Waveguide for Efficient Light Trapping and Absorption, international patent PCT/IT2010/000381 (2010) and US Patent 8/948, 561 (2015).
- P. Scudo, R. Fusco, R. Mapparapu, K. Vynck, D.S. Wiersma, Wavelength Converter and luminescent components, international patent PCT/MI2011A/002402 (2011).
- D. S. Wiersma, C. Parmeggiani, J.C. Gomez-Lavocat, K. Vynck, Light driven liquid crystal elastomer actuator, international patent PCT/EP2012/073749 (2012), WO 2014/082662 A1 (2014).
- H. Zeng, P. Wasylczyk, D. S. Wiersma, C. Parmeggiani, C. H. Ho, Multiple alignment method in liquid crystalline medium, PCT/EP2014/079221 (2014) and US patent 10/613, 392 (2020).
- D.S. Wiersma, C. Parmeggiani, J. Gomez-lavocat, K. Vynck, Path length enhancement in disordered media for increased absorption, US Patent 14/647, 529 (2015).
- D. Nuzhdin, L. Pattelli, S. Nocentini, D.S. Wiersma, Non-invasive diagnostics of photonic circuits, IT 102018000008647 (2019, PCT extension).
- A. Boschetti, A. Taschin, P. Bartolini, L. Pattelli, R. Torre, D.S. Wiersma, Method and apparatus for the measurements of spectral response, based on a random laser as illumination source (*Metodo ed apparato per la misurazione della risposta spettrale di un campione basato su un random laser come sorgente di illuminazione*), IT 10201900014748 (2019, PCT extension).

CAPACITY BUILDING AND OUTREACH

Supervision of students and postdocs

Thesis supervisor of 12 masters students, 18 PhD students, and 15 postdocs of 7 different nationalities, mainly at the University of Florence, on topics in experimental and theoretical physics, and materials science. Nearly all of these are following now a successful (international) career including professor Univ. of Cambridge, director Max Plank Institute, reader Univ. Exeter, research director CNRS, reader Imperial College, professor Tata Institute Fundamental Research, head researcher CNR, researcher at General Electric, etc.

Teaching activities (selection)

2005 – 2009 Lecturer doctorate course on micro and nano photonics, Univ. of Florence.

2010 – 2012 Doctorate course on nano photonics at the European Lab for Non-linear Spectroscopy (LENS).

2012 – today *Physics for biology students*, Univ. of Florence (using modified peer instruction).

2015 – 2019 *Science and Technology of Light*, Univ. of Florence, dept. of physics.

2019 – today *Photonic Materials*, Univ. of Florence, dept. of physics.

Organization of international conferences and schools (selection)

2005 Conference chair, SPIE meeting EOM03: Nano- and Micro-Metrology, Munich, Germany.

2005 Course director, 42nd course on quantum optics, Ettore Majorana center in Erice, Italy.

2007 Director of OSA topical meeting META, Jackson Hole, USA.

2007 Course director, Complex Optics in Mesostuctured Materials, Ettore Majorana in Erice, Italy.

2008 Course director, 44nd course on quantum optics, Ettore Majorana center in Erice, Italy.

2008 Co-director of the conference 50 years of Anderson localization, Institut Henri Poincaré, Paris.

2009 Program director CLEO Europe, Munich, Germany.

2009 Director international school of physics Enrico Fermi, *Nano optics and atomics*, Varenna, Italy.

2010 Course director of the summer school Advances in Nanophotonics III, Erice, Italy.

2012 Course director of the EPS – SIF school on Energy, Varenna, Italy.

2013 Co-director Workshop on Nonlinear Photonics, Disorder and Wave Turbulence, ICTP Trieste.

2014 Member technical program committee CLEO Focus 2014.

2014 Course director of the Institut d'Etudes Scientifique de Cargese, Corsica, France.

2015 Course director Enrico Fermi School of Physics, Erice, Italy.

2017 Director of the school *International School of Quantum Electronics*, Ettore Majorana Foundation, Erice, Italy (recurrent event since 2018 – today).

2019 Course director of the International School of Physics Enrico Fermi, *New frontiers for metrology: from biology and chemistry to quantum and data science*, Varenna, Italy.

LIST OF PUBLICATIONS

1. Wiersma, D. S. & Mana, G. The fundamental constants of physics and the International System of Units. *Rendiconti Lincei. Scienze Fisiche e Naturali* **32**, 655-663 (2021).
2. Martella, D., Mannelli, M., Squecco, R., Garella, R., Idrizaj, E., Antonioli, D., Laus, M., Wiersma, D. S., Gamberi, T. & Paoli, P. Cell instructive Liquid Crystalline Networks for myotube formation. *Iscience* **24**, 103077 (2021).
3. Lupi, F., Martella, D., Nocentini, S., Antonioli, D., Laus, M., Wiersma, D. S. & Parmeggiani, C. Dithiols as Liquid Crystalline Building Blocks for Smart Polymers via Thiol-yne Click Chemistry. *ACS Applied Polymer Materials* **3**, 1602-1609 (2021).
4. Leonetti, M., Pattelli, L., De Panfilis, S., Wiersma, D. S. & Ruocco, G. Spatial coherence of light inside three-dimensional media. *Nature Communications* **12**, 1-9 (2021).
5. De Bellis, I., Nocentini, S., Delli Santi, M. G., Martella, D., Parmeggiani, C., Zanotto, S. & Wiersma, D. S. Two-Photon Laser Writing of Soft Responsive Polymers via Temperature-Controlled Polymerization. *Laser & Photonics Reviews* **15**, 2100090 (2021).
6. Bunea, A. I., Martella, D., Nocentini, S., Parmeggiani, C., Taboryski, R. & Wiersma, D. S. Light-Powered Microrobots: Challenges and Opportunities for Hard and Soft Responsive Microswimmers. *Advanced Intelligent Systems* **3**, 2000256 (2021).
7. Yang, M., Zou, W., Guo, J., Qian, Z., Luo, H., Yang, S., Zhao, N., Pattelli, L., Xu, J. & Wiersma, D. S. Bioinspired “skin” with cooperative thermo-optical effect for daytime radiative cooling. *ACS applied materials & interfaces* **12**, 25286-25293 (2020).
8. Wiersma, D. S., van Tiggelen, B. A. & Lagendijk, A. In memory of Philip W. Anderson. *Nature Photonics* **14**, 401-402 (2020).
9. Sitti, M. & Wiersma, D. S. Pros and cons: Magnetic versus optical microrobots. *Advanced Materials* **32**, 1906766 (2020).
10. Querceto, S., Ferrantini, C., Grandinetti, B., Martella, D., Pioner, J. M., Wiersma, D. S., Cerbai, E., Pavone, F. S., Tesi, C. & Poggesi, C. Microled Illumination Towards Liquid Crystalline Elastomers Based Cardiac Contraction Assistance. *Biophysical Journal* **118**, 424a-425a (2020).
11. Nuzhdin, D., Pattelli, L., Nocentini, S. & Wiersma, D. S. Diagnostics and Characterization of Photonic Circuits by Wide-Field Spatiotemporal Imaging. *ACS Photonics* **7**, 1491-1499 (2020).
12. Martella, D., Nocentini, S., Parmeggiani, C. & Wiersma, D. S. Photonic artificial muscles: from micro robots to tissue engineering. *Faraday Discussions* **223**, 216-232 (2020).
13. De Bellis, I., Ni, B., Martella, D., Parmeggiani, C., Keller, P., Wiersma, D. S., Li, M.-H. & Nocentini, S. Color Modulation in Morpho Butterfly Wings Using Liquid Crystalline Elastomers. *Advanced Intelligent Systems* **2**, 2000035 (2020).
14. Colautti, M., Lombardi, P., Trapuzzano, M., Piccioli, F. S., Pazzagli, S., Tiribilli, B., Nocentini, S., Cataliotti, F. S., Wiersma, D. S. & Toninelli, C. Front Cover: A 3D Polymeric Platform for Photonic Quantum Technologies (Adv. Quantum Technol. 7/2020). *Advanced Quantum Technologies* **3**, 2070071 (2020).
15. Colautti, M., Lombardi, P., Trapuzzano, M., Piccioli, F. S., Pazzagli, S., Tiribilli, B., Nocentini, S.,

- Cataliotti, F. S., Wiersma, D. S. & Toninelli, C. A 3D polymeric platform for photonic quantum technologies. *Advanced Quantum Technologies* **3**, 2000004 (2020).
16. Boschetti, A., Taschin, A., Bartolini, P., Tiwari, A. K., Pattelli, L., Torre, R. & Wiersma, D. S. Spectral super-resolution spectroscopy using a random laser. *Nature Photonics* **14**, 177-182 (2020).
 17. Zou, W., Pattelli, L., Guo, J., Yang, S., Yang, M., Zhao, N., Xu, J. & Wiersma, D. S. Biomimetic Polymer Film with Brilliant Brightness Using a One-Step Water Vapor-Induced Phase Separation Method. *Advanced Functional Materials* **29**, 1808885 (2019).
 18. Zanutto, S., Sgrignuoli, F., Nocentini, S., Martella, D., Parmeggiani, C. & Wiersma, D. S. Multichannel remote polarization control enabled by nanostructured liquid crystalline networks. *Applied Physics Letters* **114**, 201103 (2019).
 19. Utel, F., Cortese, L., Wiersma, D. S. & Pattelli, L. Optimized White Reflectance in Photonic-Network Structures. *Advanced Optical Materials* **7**, 1900043 (2019).
 20. Nocentini, S., Martella, D., Parmeggiani, C. & Wiersma, D. S. 3D printed photoresponsive materials for photonics. *Advanced Optical Materials* **7**, 1900156 (2019).
 21. Martella, D., Pattelli, L., Matassini, C., Ridi, F., Bonini, M., Paoli, P., Baglioni, P., Wiersma, D. S. & Parmeggiani, C. Liquid Crystals: Liquid Crystal-Induced Myoblast Alignment (Adv. Healthcare Mater. 3/2019). *Advanced Healthcare Materials* **8**, 1970009 (2019).
 22. Martella, D., Pattelli, L., Matassini, C., Ridi, F., Bonini, M., Paoli, P., Baglioni, P., Wiersma, D. S. & Parmeggiani, C. Liquid crystal-induced myoblast alignment. *Advanced healthcare materials* **8**, 1801489 (2019).
 23. Martella, D., Nocentini, S., Parmeggiani, C. & Wiersma, D. S. Self-Regulating Capabilities in Photonic Robotics. *Advanced Materials Technologies* **4**, 1800571 (2019).
 24. Martella, D., Nocentini, S., Micheletti, F., Wiersma, D. S. & Parmeggiani, C. Polarization-dependent deformation in light responsive polymers doped by dichroic dyes. *Soft Matter* **15**, 1312-1318 (2019).
 25. Martella, D., Nocentini, S., Antonioli, D., Laus, M., Wiersma, D. S. & Parmeggiani, C. Opposite Self-Folding Behavior of Polymeric Photoresponsive Actuators Enabled by a Molecular Approach. *Polymers* **11**, 1644 (2019).
 26. Ferrantini, C., Pioner, J. M., Martella, D., Coppini, R., Piroddi, N., Paoli, P., Calamai, M., Pavone, F. S., Wiersma, D. S. & Tesi, C. Development of light-responsive liquid crystalline elastomers to assist cardiac contraction. *Circulation research* **124**, e44-e54 (2019).
 27. Ferrantini, C., Pioner, J. M., Martella, D., Coppini, R., Piroddi, N., Paoli, P., Calamai, M., Pavone, F. S., Wiersma, D. & Tesi, C. Design of Biocompatible Liquid Cristal Elastomers Reproducing the Mechanical Properties of Human Cardiac Muscle. *Biophysical Journal* **116**, 264a (2019).
 28. De Bellis, I., Martella, D., Parmeggiani, C., Pugliese, E., Locatelli, M., Meucci, R., Wiersma, D. S. & Nocentini, S. Modulation of optical properties in liquid crystalline networks across different length scales. *The Journal of Physical Chemistry C* **123**, 26522-26527 (2019).
 29. Zeng, H., Wasylczyk, P., Wiersma, D. S. & Priimagi, A. Light robots: bridging the gap between microrobotics and photomechanics in soft materials. *Advanced Materials* **30**, 1703554 (2018).
 30. Tiwari, A. K., Pattelli, L., Torre, R. & Wiersma, D. S. Remote control of liquid crystal elastomer random laser using external stimuli. *Applied Physics Letters* **113**, 013701 (2018).
 31. Pattelli, L., Egel, A., Lemmer, U. & Wiersma, D. S. Role of packing density and spatial correlations in strongly scattering 3D systems. *Optica* **5**, 1037-1045 (2018).

32. Nocentini, S., Riboli, F., Burresi, M., Martella, D., Parmeggiani, C. & Wiersma, D. S. Three-dimensional photonic circuits in rigid and soft polymers tunable by light. *ACS Photonics* **5**, 3222-3230 (2018).
33. Nocentini, S., Parmeggiani, C., Martella, D. & Wiersma, D. S. Optically driven soft micro robotics. *Advanced Optical Materials* **6**, 1800207 (2018).
34. Nocentini, S., Martella, D., Parmeggiani, C., Zanotto, S. & Wiersma, D. S. Structured optical materials controlled by light. *Advanced Optical Materials* **6**, 1800167 (2018).
35. Utel, F. *et al.* in *Light in Nature VI*. 1036709 (International Society for Optics and Photonics).
36. Nocentini, S., Martella, D., Wiersma, D. S. & Parmeggiani, C. Beam steering by liquid crystal elastomer fibres. *Soft Matter* **13**, 8590-8596 (2017).
37. Martella, D., Paoli, P., Pioner, J. M., Sacconi, L., Coppini, R., Santini, L., Lulli, M., Cerbai, E., Wiersma, D. S. & Poggese, C. Liquid crystalline networks toward regenerative medicine and tissue repair. *Small* **13**, 1702677 (2017).
38. Martella, D., Nocentini, S., Nuzhdin, D., Parmeggiani, C. & Wiersma, D. S. Photonic microhand with autonomous action. *Advanced Materials* **29**, 1704047 (2017).
39. Martella, D., Antonioli, D., Nocentini, S., Wiersma, D. S., Galli, G., Laus, M. & Parmeggiani, C. Light activated non-reciprocal motion in liquid crystalline networks by designed microactuator architecture. *RSC advances* **7**, 19940-19947 (2017).
40. Fazio, B., Irrera, A., Pirotta, S., D'Andrea, C., Del Sorbo, S., Faro, M. J. L., Gucciardi, P. G., Iati, M. A., Saija, R. & Patrini, M. Coherent backscattering of Raman light. *Nature Photonics* **11**, 170-176 (2017).
41. Egel, A., Pattelli, L., Mazzamuto, G., Wiersma, D. S. & Lemmer, U. CELES: CUDA-accelerated simulation of electromagnetic scattering by large ensembles of spheres. *Journal of Quantitative Spectroscopy and Radiative Transfer* **199**, 103-110 (2017).
42. Zeng, H., Wasylczyk, P., Parmeggiani, C., Martella, D. & Wiersma, D. S. Free-form Light Actuators—Fabrication and Control of Actuation in Microscopic Scale. *Journal of visualized experiments: JoVE* (2016).
43. Wiersma, D. S. Clear directions for random lasers. *Nature* **539**, 360-361 (2016).
44. Vynck, K., Bertolotti, J., Barthelemy, P. & Wiersma, D. S. Superdiffusion of Light in Lévy Glasses. *Optical Properties of Photonic Structures: Interplay of Order and Disorder*, 227 (2016).
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