

# BAPTISTE AUGUIÉ

Senior Lecturer, School of Chemical and Physical Sciences  
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Born in 1982, french nationality. New Zealand resident.

## RESEARCH EXPERIENCE

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- Senior Lecturer.....
- New research group, supported by a Royal Society Rutherford Discovery Fellowship**  
*Victoria University of Wellington, New Zealand* 2017
- Research Fellow.....
- Researcher at Engender Technologies Limited**  
*Photon Factory, group of Prof Cather Simpson, Auckland, New Zealand* 2016 (5 months)
- Postdoc.....
- Victoria University of Wellington, New Zealand**  
*Raman lab, Prof Eric Le Ru* 2015–2016  
Modified absorbance of dye molecules adsorbed onto metal colloids [2] • T-matrix codes [6]
- Postdoc.....
- Centro Atómico Bariloche, Argentina**  
*Photonics and optoelectronics lab, Prof Alejandro Fainstein* 2013–2015  
Novel refractive index sensor based on Tamm plasmons [4, 7] • SERS properties of rough gold substrates [5]
- Postdoc.....
- Victoria University of Wellington, New Zealand**  
*Raman lab, Profs Pablo Etchegoin and Eric Le Ru* 2011–2013  
Combined microscopy and SERS in the Kretschmann configuration [14] • Improved T-matrix code for electromagnetic scattering [8, 11, 16, 21] • Raman spectroscopy of fluorescent dyes [9, 13]
- Postdoc.....
- University of Vigo, Spain**  
*Colloid chemistry group, Prof Luis M. Liz-Marzán* 2010–2011  
Giant optical activity in chiral assemblies of plasmonic nanoparticles [18–20]
- Visiting researcher.....
- CSIC Madrid, Spain**  
*Nanophotonics theory group, Prof Javier García de Abajo* 2009, 2010 (3 months)  
Diffractive coupling in arrays of nano-antennas placed above a substrate [22]

## AWARDS

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2016: *Rutherford Discovery Fellowship* from the Royal Society of New Zealand (NZ\$800,000, 5 years)

## EDUCATION

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- PhD in physics**  
*Exeter University (UK), Supervisor: Prof W.L. Barnes* 2005–09  
Thesis: Optical properties of gold nanostructures [23–28]
- Master in physics**  
*Polytechnic School (Montréal, Canada), exchange programme* 2005  
Thesis: *Ultralow chromatic dispersion measurement of optical fibers with a tunable fiber laser* [29], Institut Femto-ST, Besançon, France

## Engineering degree in physics

National Institute of Applied Sciences (Rennes, France)

2000–05

## Baccalauréat scientifique

Lycée Blaise Pascal (Segré, France), highest honours (mention très bien)

2000

## TEACHING

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2016: “Experimental techniques” (lecturer, 18 hours, 6 students), 3rd year physics, *Victoria University of Wellington, New Zealand*

2015: “Introduction to electromagnetism” (lecturer, 9 hours, 30 students), 3rd year physics, *Victoria University of Wellington, New Zealand*

2015: Presenter at a 3-day workshop with the MacDiarmid Emerging Scientists Association (invited speaker, 3 talks). *Kaikoura, New Zealand*

2008–2016: Help and supervision of ~10 graduate students and visitors (data analysis, paper writing, technical guidance, theory.) *UK • Spain • New Zealand • Argentina*

2014: Public outreach during a *Science and Technology* week. Optics demonstrations for local primary and secondary schools. *San Carlos de Bariloche, Argentina*

2013: Post-graduate summer seminar “Here Be Dragons – Unexpected Journey to the Land of Graphics”. *Victoria University of Wellington, New Zealand*

2012: Post-graduate seminar “Data analysis and plotting with free, open source tools”. *Victoria University of Wellington, New Zealand*

2007–2008: Teaching assistant. Problem classes in mathematics, 2nd year physics. *Exeter, UK*

2006–2007: Teaching assistant. First year general physics laboratory experiments. *Exeter, UK*

## SKILLS

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### Languages.....

French: Native speaker

English: Fluent

*4 years in England, 4 years in New Zealand*

Spanish: Good

*1 year in Spain, 2 years in Argentina*

### Technical.....

- *Fabrication:* e-beam lithography • clean-room • sample preparation
- *Characterisation:* dark-field & SPR microscopy • Raman, fluorescence & CD spectroscopy
- *Theory:* light scattering, optics, electromagnetism, nano-technology
- *Data analysis:* automated reports (*literate programming*), advanced graphics

### Software, programming.....

Windows, MacOS, Linux • git, bash, • R, Matlab, C/C++

*GitHub profile:* > 70 git repositories, 15 R packages ([github.com/baptiste](https://github.com/baptiste))

*Stack Overflow profile:* > 1000 answers, 1M reads ([stackoverflow.com/users/471093/baptiste](https://stackoverflow.com/users/471093/baptiste))

### Presentation, design.....

TeX, Illustrator, Indesign, Photoshop, povray • HTML, CSS

*Personal website:* [baptiste.github.io](http://baptiste.github.io)

## CONFERENCES & PRESENTATIONS

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- 11/16: “Cluster meeting”, Christchurch, New Zealand. (*talk*)
- 11/16: MacDiarmid Institute Development Programme, Christchurch, New Zealand. (*invited talk*)
- 06/16: Dodd-Walls Centre annual meeting, Queenstown, New Zealand. (*talk*)
- 09/15: MacDiarmid Emerging Scientists Association (MESA) workshop, Kaikoura, New Zealand. (*invited speaker, 3 talks*)
- 09/15: Quantum Optics workshop, University of Otago, Dunedin, New Zealand. (*talk*)
- 03/15: International conference on Advanced Materials and Nanotechnologies (AMN7), Nelson, New Zealand. (*talk*)
- 05/14: Nano 2014 meeting, San Carlos de Bariloche, Argentina. (*poster*)
- 03/14: International Meeting on Chemical Sensors (IMCS), Buenos Aires, Argentina. (*talk*)
- 02/13: International conference on Advanced Materials and Nanotechnologies (AMN6), Auckland, New Zealand. (*talk & chairman*)
- 09/12: Quantum Nano Optics workshop, Barcelona, Spain. (*poster*)
- 09/12: Near-Field Optics (NFO), San Sebastián, Spain. (*talk & poster*)
- 08/12: International Conference On Raman Spectroscopy (ICORS), Bangalore, India. (*talk & poster*)
- 11/11: Australasian Conference on Vibrational Spectroscopy, Wellington, New Zealand. (*talk*)
- 05/11: Plasmonics meeting, Victoria University of Wellington, New Zealand. (*Organiser & talk*)
- 09/08: Electromagnetic and Light Scattering conference (ELS-11), University of Hertfordshire, UK. (*talk*)
- 07/08: Rank Prize Mini-symposium, “*The push or pull of optical momentum*”, Grasmere, UK. (*talk*)
- 04/08: Attogram project conference, “*2D surface plasmon imaging*”, Nottingham, UK. (*poster*)
- 05/07: EMRS conference, Strasbourg, France. (*talk*)
- 03/07: Discrete Dipole Approximation workshop, Bremen, Germany. (*talk*)
- 07/06: Summer school, “*The live cell from nano to micro: Mind the gap*”, Cargèse, Corsica. (*poster*)

## REFERENCES

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*Prof Eric Le Ru* – [eric.leru@vuw.ac.nz](mailto:eric.leru@vuw.ac.nz)  
School of Chemical and Physical Sciences  
Victoria University of Wellington, New Zealand

*Prof Alejandro Fainstein* – [afains@cab.cnea.gov.ar](mailto:afains@cab.cnea.gov.ar)  
Centro Atómico Bariloche & Instituto Balseiro  
San Carlos de Bariloche, Argentina

*Prof Luis Liz Marzán* – [llizmarzan@cicbiomagune.es](mailto:llizmarzan@cicbiomagune.es)  
CIC biomaGUNE,  
Donostia – San Sebastián, Spain

*Prof Javier García de Abajo* – [javier.garciadeabajo@icfo.es](mailto:javier.garciadeabajo@icfo.es)  
ICFO – The Institute of Photonic Sciences  
Castelldefels (Barcelona), Spain

*Prof Bill Barnes* – [W.L.Barnes@exeter.ac.uk](mailto:W.L.Barnes@exeter.ac.uk)  
Exeter University, School of Physics  
Exeter, United Kingdom

H-index: 15, >1400 citations

Referee for *Physical Review Letters*, *Physical Review B*, *ACS Nano*, *ACS Photonics*, *Proceedings of the National Academy of Sciences*, *Scientific Reports*, *Journal of Physical Chemistry C*, *Optics Express*...

- 1 **Baptiste Auguié**, Walter R C Somerville, Stanley Roache, and Eric C Le Ru. "Numerical investigation of the Rayleigh hypothesis for electromagnetic scattering by a particle". *Journal of Optics* 18.7 (2016), p. 075007. DOI: 10.1088/2040-8978/18/7/075007.
- 2 Brendan L. Darby, **Baptiste Auguié**, Matthias Meyer, Andres E. Pantoja, and Eric C. Le Ru. "Modified optical absorption of molecules on metallic nanoparticles at sub-monolayer coverage". *Nature Photonics* 10.1 (2016), pp. 40-45. DOI: 10.1038/nphoton.2015.205.
- 3 W.R.C. Somerville, **Baptiste Auguié**, and E.C. Le Ru. "SMARTIES: User-friendly codes for fast and accurate calculations of light scattering by spheroids". *Journal of Quantitative Spectroscopy and Radiative Transfer* 174 (2016), pp. 39-55. DOI: <http://dx.doi.org/10.1016/j.jqsrt.2016.01.005>.
- 4 **Baptiste Auguié**, Axel Bruchhausen, and Alejandro Fainstein. "Critical coupling to Tamm plasmons". *Journal of Optics* 17.3 (2015), p. 035003. DOI: 10.1088/2040-8978/17/3/035003.
- 5 Luis A. Guerra Hernández, María Antonieta Daza Millone, Emiliano Cortés, Marcos Federico Castez, **Baptiste Auguié**, María E. Vela, Roberto C. Salvarezza, and Alejandro Fainstein. "Synergetic light-harvesting and near-field enhancement in multiscale patterned gold substrates". *ACS Photonics* 2.9 (2015), pp. 1355-1365. DOI: 10.1021/acsp Photonics.5b00345.
- 6 Walter R. C. Somerville, **Baptiste Auguié**, and Eric C. Le Ru. "Accurate and convergent T-matrix calculations of light scattering by spheroids". *Journal of Quantitative Spectroscopy and Radiative Transfer* 160 (2015), pp. 29-35. DOI: 10.1016/j.jqsrt.2015.03.020.
- 7 **Baptiste Auguié**, María Cecilia Fuertes, Paula C. Angelomé, Nicolás López Abdala, Galo J. A. A. Soler Illia, and Alejandro Fainstein. "Tamm plasmon resonance in mesoporous multilayers: Toward a sensing application". *ACS Photonics* (2014). DOI: 10.1021/ph5001549.
- 8 Eric C. Le Ru, Walter R.C. Somerville, and **Baptiste Auguié**. "Radiative correction in approximate treatments of electromagnetic scattering by point and body scatterers". *Physical Review A* 87.1 (2013), p. 012504. DOI: 10.1103/PhysRevA.87.012504.
- 9 Antoine Reigue, **Baptiste Auguié**, Pablo G Etchegoin, and Eric C. Le Ru. "CW measurements of resonance Raman profiles, line-widths, and cross-sections of fluorescent dyes: application to Nile Blue A in water and ethanol". *Journal of Raman Spectroscopy* 44.4 (2013), pp. 573-581. DOI: 10.1002/jrs.4233.
- 10 Dmitri Schebarchov, **Baptiste Auguié**, and Eric C. Le Ru. "Simple accurate approximations for the optical properties of metallic nanospheres and nanoshells". *Physical Chemistry Chemical Physics* 15.12 (2013), pp. 4233-42. DOI: 10.1039/c3cp44124e.
- 11 Walter R. C. Somerville, **Baptiste Auguié**, and Eric C. Le Ru. "A new numerically stable implementation of the T-matrix method for electromagnetic scattering by spheroidal particles". *Journal of Quantitative Spectroscopy and Radiative Transfer* 123 (2013), pp. 153-168. DOI: 10.1016/j.jqsrt.2013.01.023.
- 12 E. Almpanis, N. Papanikolaou, **Baptiste Auguié**, C. Tserkezis, and N. Stefanou. "Diffractive chains of plasmonic nanolenses: combining near-field focusing and collective enhancement mechanisms". *Optics Letters* 37.22 (2012), pp. 4624-4626. DOI: 10.1364/OL.37.004624.
- 13 **Baptiste Auguié**, Antoine Reigue, Eric C. Le Ru, and Pablo G. Etchegoin. "Tiny peaks vs mega backgrounds: A general spectroscopic method with applications in resonant Raman scattering and atmospheric absorptions". *Analytical Chemistry* 84.18 (2012), pp. 7938-7945. DOI: 10.1021/ac301696p.
- 14 Stefan A. Meyer, **Baptiste Auguié**, Eric C. Le Ru, and Pablo G. Etchegoin. "Combined SPR and SERS microscopy in the Kretschmann configuration". *The Journal of Physical Chemistry A* 116.3 (2012), pp. 1000-1007. DOI: 10.1021/jp2107507.

- 15 Walter R.C. Somerville, **Baptiste Auguié**, and Eric C. Le Ru. "Distribution of the SERS enhancement factor on the surface of metallic nano-particles". *Nanotechnology*. IEEE-NANO. 2012, pp. 1–4. DOI: 10.1109/NANO.2012.6321930.
- 16 Walter R.C. Somerville, **Baptiste Auguié**, and Eric C. Le Ru. "Severe loss of precision in calculations of T-matrix integrals". *Journal of Quantitative Spectroscopy and Radiative Transfer* 113.7 (2012), pp. 524–535. DOI: 10.1016/j.jqsrt.2012.01.007.
- 17 Sara Abalde-Cela, **Baptiste Auguié**, Martin Fischlechner, Wilhelm T. S. Huck, Ramón Alvarez-Puebla, Luis M Liz-Marzán, and Chris Abell. "Microdroplet fabrication of silver-agarose nanocomposite beads for SERS optical accumulation". *Soft Matter* 7 (2011), pp. 1321–1325. DOI: 10.1039/C0SM00601G.
- 18 **Baptiste Auguié**, José Lorenzo Alonso-Gómez, Andrés Guerrero-Martínez, and Luis M. Liz-Marzán. "Fingers crossed: Optical activity of a chiral dimer of plasmonic nanorods". *The Journal of Physical Chemistry Letters* 2.8 (2011), pp. 846–851. DOI: 10.1021/jz200279x.
- 19 Andrés Guerrero-Martínez, José Lorenzo Alonso-Gómez, **Baptiste Auguié**, M. Magdalena Cid, and Luis M. Liz-Marzán. "From individual to collective chirality in metal nanoparticles". *Nano Today* 6.4 (2011), pp. 381–400. DOI: 10.1016/j.nantod.2011.06.003.
- 20 Andrés Guerrero-Martínez, **Baptiste Auguié**, José Lorenzo Alonso-Gómez, Sergio Gómez-Graña, Zoran Džolic, Mladen Žinic, M. Magdalena Cid, and Luis M. Liz-Marzán. "Intense optical activity from three-dimensional chiral ordering of plasmonic nanoantennas". *Angewandte Chemie International Edition* 50 (2011), pp. 5499–5503. DOI: 10.1002/anie.201007536.
- 21 Walter R. C. Somerville, **Baptiste Auguié**, and Eric C. Le Ru. "Simplified expressions of the T-matrix integrals for electromagnetic scattering". *Optics Letters* 36.17 (2011), pp. 3482–3484. DOI: 10.1364/OL.36.003482.
- 22 **Baptiste Auguié**, Xesús M. Bendaña, William L. Barnes, and F. Javier García de Abajo. "Diffractive arrays of gold nanoparticles near an interface: Critical role of the substrate". *Physical Review B* 82.15 (2010), p. 155447. DOI: 10.1103/PhysRevB.82.155447.
- 23 **Baptiste Auguié**. "Optical properties of gold nanostructures". PhD thesis. University of Exeter, 2009. DOI:hdl.handle.net/10036/73955.
- 24 **Baptiste Auguié** and William L. Barnes. "Diffractive coupling in gold nanoparticle arrays and the effect of disorder". *Optics Letters* 34.4 (2009), pp. 401–403. DOI: 10.1364/OL.34.000401.
- 25 W. Andrew Murray, **Baptiste Auguié**, and William L. Barnes. "Sensitivity of localized surface plasmon resonances to bulk and local changes in the optical environment". *Journal of Physical Chemistry C* 113.13 (2009), pp. 5120–5125. DOI: 10.1021/jp810322q.
- 26 James Parsons, Euan Hendry, Christopher Burrows, **Baptiste Auguié**, J. Roy Sambles, and William L. Barnes. "Localized surface-plasmon resonances in periodic nondiffracting metallic nanoparticle and nanohole arrays". *Physical Review B* 79.7 (2009), p. 073412. DOI: 10.1103/PhysRevB.79.073412.
- 27 **Baptiste Auguié** and William L. Barnes. "Collective resonances in gold nanoparticle arrays". *Physical Review Letters* 101.14 (2008), p. 143902. DOI: 10.1103/PhysRevLett.101.143902.
- 28 James Parsons, Euan Hendry, **Baptiste Auguié**, William L. Barnes, and J. Roy Sambles. "Localised modes of sub-wavelength hole arrays in thin metal films". *SPIE proceedings* 6988 (2008). DOI: 10.1117/12.780465.
- 29 **Baptiste Auguié**, Arnaud Mussot, Anne Boucon, Eric Lantz, and Thibaut Sylvestre. "Ultralow chromatic dispersion measurement of optical fibers with a tunable fiber laser". *Photonics Technology Letters* 18.17 (2006), pp. 1825–1827. DOI: 10.1109/LPT.2006.881148.