

# CURRICULUM VITAE

## James Hugh Gervase Owen

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### CURRENT POSITION

**Jun 2007** Dépt. Physique de la Matière Condensée, Université of Genève, Suisse. Maitre d'Assistant,

- Startup of new research group, focussed on magnetic properties of nanoscale systems.
- Designing and building new "Mott-STM" to measure spin properties locally.
- Growth of magnetic atomic chains on nanoline templates: SNSF grant awarded Mar. 2008.

### PREVIOUS EMPLOYMENT

**Nov 2004** International Centre for Young Scientists, National Institute for Materials Science, Tsukuba, Japan ICYS Fellow in Nanomaterials.

- Independent Research Project. Research budget of \$50,000 p.a.
- Three-year research fellowship; "nanoline templating" technique for growth of self-assembled arrays of nanostructures on Si(001). Characterization of the nanowires, nanocluster arrays.
- Offered permanent researcher position at NIMS Jan.2007.

**July 2002** Materials Department, Oxford University, Oxford, U.K. Postdoctoral Research Fellow as part of LINK project entitled "Nanoelectronics at the Quantum Edge"

- The project aimed to implement a quantum logic device using spin-active metallofullerenes as qubits.
- Collaboration with Hitachi Cambridge Lab and National Physical Lab, Teddington (NPL).
- Supervision and mentoring of graduate and undergraduate students.
- Writing of grant reports and presentation of results at quarterly meetings and international conferences.

**March 2001** Japanese Science and Technology Agency Fellowship based at AIST (formerly ETL), Tsukuba, Japan. 3/2001 – 4/2002 as part of project entitled "Active Atomic-Scale Interconnects"

- The project aimed to measure physical and chemical properties of Bi nanolines.
- Learnt use of atomistic modelling code, and determined structure of Bi nanolines.

**Aug-Nov 2000** Postdoctoral Researcher of Bi nanowires at ETL, Tsukuba, Japan (now AIST).

**1998-2000** UCLA and HRL Laboratories, Malibu, CA, USA as part of NSF/DARPA "Virtual Integrated Prototyping" project, Postdoctoral Researcher.

- Refurbishment and operation of ultra-high vacuum (UHV) molecular beam epitaxy (MBE) system for growth of GaAs, InAs, AlSb. Learnt III-V MBE techniques from scratch.
- Played key role in procurement and installation of UHV STM system at HRL labs.
- Took initiative in promoting interaction between experimentalists and theoreticians to drive progress towards overall project goals.

**1996-1998** University of California, Santa Barbara, Dept. Chemical Engineering, Santa Barbara, CA, USA, Postdoctoral researcher.

- Supervised two graduate students in the lab, and in writing their theses.

## MAJOR RESEARCH ACHIEVEMENTS

- 39 peer-reviewed published papers; 8 conference papers, 19 first author. Currently 2 papers in preparation.
- Measured motion of single and paired H atoms on Si(001), measured activation barriers, 1.68 eV, 1.96 eV (confirmed by modelling of D.R.Bowler)
- Observed atomic-scale nucleation and growth processes of Si, and of Ge “hut clusters”, on Si(001) by in-situ STM at 500-750 K under a flux of disilane. (with K.Miki and I.Goldfarb.)
- Observed Bi nanolines for the first time in 1995 (with K.Miki)
- Identified link between RHEED oscillation decay constant and STM morphology in MBE of InAs (with J.J.Zinck)
- Demonstrated control of morphology using RHEED as in-situ sensor (with J.J.Zinck).
- Identified “haiku” structure of Bi nanoline by a combination of STM, tightbinding and DFT (with K.Miki, D.R.Bowler).
- Determined identity of two isomers of Nd@C<sub>82</sub> by STM/DFT (with D.F. Leigh, S-M. Lee).
- Invited review article on the Bi nanolines in J. Mat. Sci.(with D.R. Bowler, K.Miki).
- Developed “nanoline templating” method for self-assembly of epitaxial nanowires (1nm x 100nm), and nanocluster arrays of noble metals (Ag, Au, Pt, Pd) and transition metals (Fe, Co).

## RESEARCH SKILLS

- Over 10 years' experience in ultra high vacuum (UHV) procedures and STM.
- Other Surface Science techniques – AFM, RHEED, LEED, AES, photoemission.
- Semiconductor thin film growth by MBE with solid and gas sources, including hot STM during growth to determine atomic-scale processes.
- Clean room experience for preparation of semiconductor samples. Photo and e-beam lithography, dry etching, sputter deposition, and other techniques.
- Extensive oral presentation experience including international conferences.
- Extensive experience of close interaction with theoretical modellers; use of tightbinding code to test candidate structures for Bi nanoline.
- Hand-coded personal Website in X-HTML/CSS.

## INTERPERSONAL SKILLS - management, supervision, teaching.

- Crystallography teaching assistant during DPhil (Oxford).
- Training of students and junior postdocs in UHV/ STM skills (Oxford, UCSB, UCLA, ICYS, UniGe).
- Supervision/mentoring of undergraduate and PhD students (UCSB, Oxford, ICYS, UniGe).
- Participation in building refurbishment committee (Oxford); taken lead role in interactions between ICYS Fellows and NIMS management; lab design and setup (UniGe).
- Control of research budget during ICYS Fellowship, including equipment procurement.
- Co-PI on SNSF proposal, “Local electronic and magnetic properties of metal atomic chains.”

## EDUCATION

**1993-1996** D.Phil. Materials Department, Oxford University. *'Diffusion and reaction of small adsorbates on silicon, using an elevated-temperature scanning tunnelling microscope(STM)'* Viva date: 18<sup>th</sup> December 1996

**1989-1993** Metallurgy and Materials Science, St. Anne's College, Oxford. 1-year Part II research project in STM of silicon (001) surface. B.A. (Hons.) 1st class.

## AWARDS

**Feb. 2001** STA Research Fellowship (now JST research fellowship) at AIST, Tsukuba, Japan.

**Aug. 2004** ICYS Research Fellowship at NIMS, Tsukuba, Japan.

## ADDITIONAL INFORMATION

- Member of Materials Research Society.
- Completed 3 courses of Japanese at Berlitz language school, Tsukuba Science City, Japan.