MICHAEL J. JOHNSON

Demographics

Nationality: British E-mail: michael@johnsons.li

Relevant work experience

2010-present pt **Founder**, JA, United Kingdom / United States of America / China
Creating projects, technologies and missions supporting very low cost access to space for all:

iCubeSat.org – Created and organise forum for the Interplanetary CubeSat community to present, disseminate and archive their ideas, work & tools. Workshops at MIT (2012), Cornell (2013), Caltech (2014), Imperial (2015) & Oxford (2016). >500 attendees, >100K downloads.

Microgravity-on-Demand – open access shared parabolic flight experiment platform. First flight 2011 (Zero-G, Inc.) with experiments from Cornell, JA and the UK Space Agency

myGroundStations.com - Global Redundant Array of Inexpensive Ground Stations supporting ChipSat to SmallSat, LEO to deep space missions. STFC Science in Society S&SC Award.

myPocketQub / myPocketQub IQEA / Q-POD - Open source picosatellite / CubeSat subsystem / platform compatible with DNEPR. Collaborators: Sapienza-Università di Roma and MSU.

Open Mission Control/Pocket Mission Control - Graphical mission control app/framework for operations and outreach. ESA Summer of Code in Space mentoring organisation 2011-2014. Sponsors include RAL Space, Satellite Applications Catapult, Space Internship Network.

PocketSpacecraft.com – Commercial Build-Launch-Operate vehicle for all JA projects and formats. Mission to the Moon (2016) has >1000 spacecraft backed by >2500 citizen explorers from >40 countries currently manifested; >50000 people from >90 countries following.

Designed and implement assembly, integration, verification and test program including low earth orbit, near space and deep space communication/navigation tests, hypervelocity impact test, metrology program, planetary protection and more. Designed mission and most hardware and subsystems including attitude determination and control systems, communications antennas and radios (U/V/S band), custom interplanetary CubeSat structure and deployer, redundant flight computers and software, thin film spacecraft and printable instruments, power systems and more. Recruited and manage team of >300 volunteers from >30 countries.

Spacecraft-on-Demand – Spacecraft design/build/launch using Prepositioned Orbiting 3D-Printers to build spacecraft on orbit. OSA waiver obtained for 2U ISS NanoLab (date TBC).

plus other Open Source Space System related science, engineering and policy projects including CubeSat Cookbook, CubeSat-on-Demand, International CubeSat Consortium, OpenCCSDS, OpenSpace365, Outer Space Act reform campaign and PocketPayloads.

2014-present pt **Visiting Fellow**, Department of Aerospace Engineering, University of Bristol, UK

2013-2014 **Visiting Fellow**, Department of Computer Science, University of Bristol, UK

2012-present pt **Resident**, Pervasive Media Studio, Watershed Arts Trust/UoB/UWE, Bristol, UK
Project mentor/supervisor 2nd year undergraduates (18x) and M.Sc. student thesis/internship (1x) six month projects. Undergraduate, postgraduate and outreach guest lectures.

2012-present pt **Study co-lead**, Keck Institute for Space Studies, California Institute of Technology, USA
'Small Satellites: A revolution in Space Science' at invitation of study co-leads Norton (JPL) and Pellegrino (Caltech). Study group of thirty invited scientists, engineers and students.

2011-2012 pt **Visiting Scientist**, Open Source Laboratory/Space Systems Design Studio, Cornell University
Created KickSat mission (3U CubeSat + 104 ChipSats, NASA ELaNa 5 launch 2014, first KickStarter funded space mission), ChipSat/CubeSat exploration systems (e.g. CAVA, CHAMPAGNE, GaAstrochip), thin film spacecraft proof of concepts..

2010-2012 pt **Director of Space Projects**, UKSEDS, United Kingdom

1997-2008 **Founder/CEO,** SBL, The Netherlands/United Kingdom/United States of America
Started company and managed development, sales and consultancy teams bringing forty shrink-wrap software applications, books, DVDs, videos and classroom courses to more than fifty thousand users in sixty one countries for the design and management of clinical trials. Provided strategic consultancy for organisations such as IBM, P&G and the WHO.

1989-1998 ft/pt **Contract software consultant** for more than forty contracts worldwide

1992-1994 pt **Research assistant**, Centre for Biological & Medical Systems, Imperial College, London, U.K

1990 **Research assistant**, Semiconductor Materials Interdisciplinary Research Centre, London, U.K.

1989-1990 pt **Research assistant**, Space and Atmospheric Physics Group, Imperial College, London, U.K.

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Education

2015-present pt **Ph.D. (Computing/Aerospace)**, Imperial College London, United Kingdom
Spacecraft-on-Demand CPX: optimising the in-situ manufacture of sensor devices collecting scientific data at spatiotemporal scales spanning decades and billions of kilometers.
Imperial-Tsinghua University Fellowship. Authored CEOI/STFC/UKSA/UROP funded grants.

1994 **Pg.Dip. (Experimental & Molecular Pathology/Biotechnology)**, University of Dundee, U.K.

1989-1993 **B.Sc. (Physics)**, Imperial College of Science, Technology and Medicine, London, U.K.

Skills

- Proven ability to design, manage and deliver complex local and international interdisciplinary projects.
- Planning, presentation and innovation skills have contributed to projects being awarded substantial sales, investment, grants and awards from companies, venture capitalists, governments and charities globally.
- Principle-investigator/co-investigator/engineer for ChipSat, CubeSat, NanoLab, PocketQub, parabolic flight experiments (including working in microgravity), radioastronomy and thin-film spacecraft/lander research projects.
- Proficient commercial and academic programmer (and systems administrator) of:
  Microsoft Windows 3.x/95/98/200X/CE/ME/NT/PocketPC/XP/Vista/7/8/10 and DOS; UNIX including Linux, Solaris, SunOS and Ultrix; VMS; Apple iOS (iPhone/iPad), MacOS and Newton OS; PalmOS; EPOC16/32 (Psion products); GEOS (Nokia Communicator product); Nintendo Gameboy Advance/DS, Sega Dreamcast, Sony Playstation2/3/PSP, Symbian, XBOX/XBOX360, Acorn RISC OS; custom hardware and more

  in the programming languages:
  C (inc. C, C++, C#, Objective C), BASIC (inc. Visual Basic/VBA/VBScript), Delphi, FORTRAN, Java, JavaScript/Jscript, Pascal, Perl, assembly (6502/ 68K/ 8051/ x86/ ARM/ AVR/ MIPS/ MSP/ PowerPC/ SHx/ Txxx/ Z80), Processing, Prolog, Excel macro, xBase, DQL, SQL, PreQL, AppleScript, NewtonScript, Self and more

  implementing:
  database engines (flat file, relational and object oriented); graphical user interface applications and libraries; assemblers, compilers, translators, interpreters and virtual machines; system emulators; installers, real-time/batch signal/image processing; parallel algorithms; advanced HTTP clients, servers and ASP/CGI scripts (including data driven web sites, and e-commerce systems); HTML/RTF/PDF/XML generators/systems, Windows/Berkley sockets, ODBC, ActiveX and DDE compliance; embedded operating systems / libraries, compression / encoding / encryption libraries and more

  using the following libraries/packages (at application and API level) where appropriate:
  ADO, ATL, CDISC, COM, CORBA(MED), CUDA, MFC, NAG, OTP, SIMPLE, SoftTree, UNIRAS, WinZip, Zlib; Microsoft Office (Word/Excel/Access/Outlook/PowerPoint/Project) Windows/MacOS; Arduino, Atmel Studio, Energia, Eclipse, Microsoft Visual Studio, Metroworks CodeWarrior, GCC, TurboC, Unity; (Visual) SourceSafe Windows/MacOS, (Win)CVS, Git, SVN; InstallShield Professional/Express, InstallerVISE, Wise Installer; Centura, DataEase, DB2, Oracle, Paradox, SQL Server; BR Space, Cadence, DRAMA, EAGLE, ESATAN, ExpressPCB, GMAT, Google SketchUp, LabVIEW, Mathematica, MATLAB, PADS, Quartus Prime, SolidWorks, STK; SAS, SPSS, SNSS; VMWare, Rational Test Suite, Seapine TestTrack; Exact Globe, Intuit QuickBooks, Maximiser Enterprise, Adobe Acrobat/Photoshop/Illustrator, CorelDRAW and more
- Digital (microprocessor/microcontroller/FPGA) and radio frequency (including antennas) circuit, printed circuit board and driver design and implementation for peripheral, embedded and standalone systems. Thin film and semiconductor device design, fabrication, characterization, packaging and reverse engineering.
- Design/build/operation of fixed/dial up/wireless/satellite/deep space communication systems and networks
- >100 prerecorded or live television, radio, and print interviews (e.g. ABC, BBC, Fox, Nature, Times)

Selected aerospace publications and conference presentations

Johnson, M.J. PIXE 2016: PocketSpacecraft.com Integrated eXploration Environment update. *5th Interplanetary CubeSat Workshop, Oxford, United Kingdom, May 2016*

Johnson, M.J. and McCann, J. Replenishing prepositioned Spacecraft-on-Demand printers. *Royal Astronomical Society Meeting on The Use of Extraterrestrial Resources to help Facilitate Space Science and Exploration, London, United Kingdom, April 2016*

Johnson, M.J. and McCann, J. Uniform Trajectory Locators (UTLs) – an open API for trajectory discover and utilization. *6th International Conference on Astrodynamics Tools and techniques, Darmstadt, Germany, March 2016*

Johnson, M.J., Wilson, C. and McCann, J. A planet-wide meteorological microlander concept for Mars. *Royal Astronomical Society Meeting on Weather on Other Planets, London, October 2015*

Johnson, M.J., Wertheimer, E. and Berthoud, L. PocketRTG: an early prototype radioisotope thermoelectric generator for interplanetary CubeSats and education. *Space Nuclear Power workshop, London, United Kingdom, September 2015*

Johnson, M.J. PIXE 2015: PocketSpacecraft.com Integrated eXploration Environment update.*4th Interplanetary CubeSat Workshop, London, May 2015*

Johnson, M.J. A review of planetary and space science projects presented at iCubeSat, the Interplanetary CubeSat Workshop. *European Geosciences Union General Assembly 2015, Vienna, Austria, April 2015.*

Johnson, M.J. The PocketSpacecraft.com Integrated eXpolration Environment (PIXE). *European Geosciences Union General Assembly 2015, Vienna, Austria, April 2015.*

Johnson, M.J. En masse, on demand on orbit: Interplanetary Pocket Spacecraft licensing and regulatory challenges. *ITU Symposium and Workshop on Small Satellite Regulation and Communication Systems, Prague, Czech Republic, March 2015.*

Norton, C.D., Pellegrino, S., Johnson, M.J., et al. Small Satellites: A Revolution in Space Science . *Final report, Keck Institute for Space Studies, California Institute of Technology, USA, 84 pp, August 2014*

Johnson, M.J. PocketSpacecraft.com Integrated eXploration environment, 3rd *Interplanetary CubeSat Workshop, Pasadena, USA May 2014*

Norton, C.D., Pellegrino, S., and Johnson, M.J. Findings of the KECK Institute for Space Studies Program on Small Satellites: A Revolution in Space Science. *27th Annual AIAA/USU Conference on Small Satellites, Logan, USA, August 2013*

Johnson, M.J. Pocket Spacecraft Modular Interplanetary Mission Architecture,2nd *Interplanetary CubeSat Workshop,Ithaca,USA May2013*

Johnson, M.J. ChipCube: an open source, open access generic planetary science and exploration system. *1st Interplanetary CubeSat Workshop, Cambridge, USA, May 2012*

Hedman, M.M., Tiscareno, M.S., Johnson, M.J. Scouting Saturn's Rings with Small Spacecraft. *1st Interplanetary CubeSat Workshop, Cambridge, USA, May 2012*

Tiscareno, M.S., Hedman, M.M., Nicholson, P.D., Burns, J.A. Johnson, M.J. Open questions in the outer solar system: CubeSat/ChipSat opportunities? *1st Interplanetary CubeSat Workshop, Cambridge, USA, May 2012*

Barschke, M.F., Özkan, Ş., Johnson, M.J. Mission Control for Citizen Space Exploration. *SpaceOps 2012, Stockholm, Sweden, June 2012*

Johnson, M.J., Manchester, Z.R., Peck, M.A. KickSat.org – an open source ChipSat dispenser and citizen space exploration proof of concept mission, *European CubeSat Symposium, Brussels, Belgium, January 2012*

Gabbani, N.K., Barschke, M.F., Potts, D.R., Marx, J.P., Barrera Ars, J., Henry, A.K., Johnson, M.J. OrbitView – an imaging system for inspecting small spacecraft on orbit. *European CubeSat Symposium, Brussels, Belgium, January 2012*

Barschke, M.F., Özkan, Ş., Johnson, M.J. Open Mission Control – an open platform for flight projects and outreach. *European CubeSat Symposium, Brussels, Belgium, January 2012*

Johnson, M.J., Spangelo, S.C. Crowdsourcing space exploration with Spacecraft-on-Demand, *62nd International Astronautical Congress, Cape Town, South Africa, October 2011*

Barschke, M., Özkan, Ş, Johnson, M.J. Open source mission control software for small space projects. *Deutscher Luft- und Raumfahrtkongress 2011, Bremen, Germany, September 2011*

Johnson, M.J. CubeSat-on-Demand – a generic reconfigurable reusable spacecraft system. *2011 CubeSat Developers' Workshop. Logan, USA, August 2011*

Johnson, M.J. PocketSpacecraft – the start of the personal space age? *UK Space Conference 2011, Warwick, United Kingdom, July 2011*

Johnson, M.J. myPocketQub 442 – open source open access to space. *UK Space Conference 2011, Warwick, United Kingdom, July 2011*

Johnson, M.J. Citizen Operated Spacecraft. *dotAstronomy3, Oxford, United Kingdom, April 2011*

Brookes, A., Hartikainen, T., Hine, N., Potts, D., Johnson, M.J. myPocketQub IQEA 442. *UKSEDS Conference 2011, Manchester, United Kingdom, 2011.*

Johnson, M.J. myPocketQub IQEA – an inexpensive flexible open source CubeSat subsystem. *1st IAA Conference on University Satellite Missions and CubeSat Workshop, Rome, Italy, January 2011*

Panesar, T., Johnson, M.J. myGroundStations.com – a global open source ground station network. *1st IAA Conference on University Satellite Missions and CubeSat Workshop, Rome, Italy, January 2011*

Johnson, M.J. An open source student payload bid for UKube-1. *UKSEDS Satellite Workshop, Sidmouth, United Kingdom, November 2011*

Johnson, M.J. myPocketQub.com: an open source nano-satellite project. *2010 Summer CubeSat Workshop, Logan, USA, August 2010.*

In addition I have written, contributed to, or presented more than 200 books, conference presentations/posters, government publications, invited talks, newspaper and magazine articles, public lectures, publications and reports on aerospace, computer science, medical informatics, meteorology and physiology.