# Curriculum Vitae

**Name**

**Álvaro Manuel Madureira Pinto**

**Bith Date**

31-05-1965

**Email:**

alvaro.pinto@fc.ul.pt or apinto@museus.ul.pt

**Academic degrees**

PhD candidate, U. of Lisbon; Subject matter: Mineralogy, Mineral Geochemistry and metalogeny of ore massive sulfides deposit of global interest; Comparative study of Neves Corvo (Portugal) and PACAMANUS (Manus Basin – Papua New Guinea).

M.Sc., (Geology - Mineralogy, Crystallography and Metallogeny), U. of Lisbon, July 27, 1999.

Licenciate, Geology, (5 yrs – Scientific and Technologic area), U. of Porto, December 11, 1987.

**Speciality**

Ore Petrology

**Complementary Education**

Environmental Management: ISO 14001: Environmental Management Training.

Pos-Graduation in Management – Quality Engineering, 2004.

Health and Safety Management: Safety applied to industrial and laboratory environments.

Fire extinction and risk in industrial areas; System Coaching Course (NOSA).

Laboratory safety - Practices and Procedures.

“Short Course on Hydrothermal Ore Deposits: Ores in Sediments”; University of Ottawa, 19 - 26 Feb. 2011 (Department of Earth Sciences at the University of Ottawa - Course Code: U of Ottawa GEO5302M).

- Module 1: Introduction to Ore Systems in Sedimentary Basins
  (Stuart Bull, CODES; Wayne Goodfellow, GSC)
- Module 2: Lead, Zinc, Copper and Silver Deposits
  (David Leach, USGS; Paul Spry, Iowa State; Stuart Bull, CODES)
- Module 3: Gold and PGE Deposits
  (Richard Goldfarb, USGS; Jean Cline, USGS; Gema Olivo, Queen’s)
- Module 4: Uranium and Iron Deposits
  (David Burrows, Vale; Andrey Bekker, UManitoba; Jan Peter, GSC)

**Research Interest**

Ore Mineralogy in exploration and exploitation, mineral beneficiation and environmental impacts; Submarine Hydrothermal Activity; Ore Mineral Geochemistry.

**Links to Active Research or Personal Data**

http://creminer.fc.ul.pt/

**Institutional Research Address**

Museu Nacional de História Natural da Universidade de Lisboa – MNHN-UL
Rua da Escola Politécnica N.º 58, 1250-102 Lisboa; Phone: +351 213 921 804; E-mail: apinto@museus.ul.pt

Centro Ciência Viva do Lousal – Mina de Ciência
Av. Frédéric Velge 7570-006 Lousal; Phone: +351 269 508 160; Fax: +351 269 508 160; E-mail: apinto@lousal.cienciaviva.pt

CREMINER/Dep. Geologia; Faculdade de Ciências, Universidade de Lisboa; Edif. C6 Piso 4, 1749-016 Campo Grande; Lisboa – Portugal; Phone: +351 750 00 00 (ext. 26461); E-mail: ampinto@fc.ul.pt

**Present position, institution, starting date:**

Managing director @ the Centro Ciência Viva do Lousal – Mina de Ciência; Associação Centro Ciência Viva do Lousal, 2010.

Applied Advanced Mineralogist @ the Museu Nacional de História Natural – Universidade de Lisboa, 2006;

Researcher @ the CREMINER-FCUL, 1998.

Preparation and commissioning of the mineralogical laboratory for applied opaque mineralogy at the CREMINER – GeoFCUL. Management of optical microscopy laboratory facilities.

**Previous positions – Professional experience, dates in reverse chronological order:**

CREMINER-FCUL - Responsible for the studies of Applied Mineralogy on exploration, mineral beneficiation and environmental impacts for the Somincor S.A. – Neves Corvo Mining Company, 2001-2010.

Assistant Professor, U. of Lisbon, 2000-2002 – Practical courses on: General Geology; Mineralogy and Mineral Resources.

Responsible by the Metrology area at the Neves Corvo Mine - Quality Department, in accumulation with the other duties such as observer auditor, suppliers evaluation based on risk analysis; coordinator for the conception and implementation of the Internal emergency plan of the Laboratory of the Neves Corvo Mine, 1999 – 2001

Ore mineralogist of the Laboratory of the Neves Corvo Mine, 1988 - 2001

Responsible by the follow technical operations:

Preparation and commissioning of the mineralogical laboratory at the Neves Corvo Mine; ore mineralogy and textural characterization during the exploration, exploitation and mineral concentration. Parameter definition to support the mineral processing operations at the industrial installations; quality optimisation of the final concentration; coordination of the research and development on the mineralogical and geochemical studies; budget management.

Mine Geologist of the Mine Geology Department at the Neves Corvo Mine.1988 – 1988

**Main scientific technical area of research:**

Geology – Ore Mineralogy for exploration, mineral beneficiation and environmental impacts
Submarine Hydrothermal Activity
Mineral Geochemistry.

**Other scientific technical areas of interest or activities:**

Mineral Deposits; Geochemistry and Mineral Geochemistry; Mineralogy and Marine Geology.
Total Quality Management in Research & Development
Total Quality Management in Education
Metrology

**Scientific Cruises at Sea:**

H2Deep leg 2 at the Arctic sea, 2008 (EuroMARC Project) - Ultra-slow spreading and hydrogen-based deep biosphere: A site survey for zero-age drilling of the Southern Knipovich Ridge on bord G.O. SARS; ROV Bathysaurus; P.I.: Rolf-Birger Pedersen.

SEAHMA-1, 2002 (Atalante/Victor (R.O.V.), Azores Region – Dives: Rainbow, Menez Gwen, Saldanha and Lucky Strike fields, F.J.A.S. Barriga chief-scientist).
BISMARCK 2002 - FR 02/2002 CRUISE, 2002 - Variability related to subduction style of submarine hydrothermal and volcanic activity in the Western Bismarck Island Arc, Papua New Guinea (Franklin (CSIRO), R. Binns chief-scientist).

ODP - Ocean Drilling Program, Leg 193, Manus Basin (Papua New Guinea), 2000/1 (Joides Resolution), Anatomy of an Active Felsic-Hosted Hydrothermal System, Eastern Manus Basin. (R. Binns, F.J.A.S. Barriga, chief-scientists).

TTR-10, Leg 2, 2000 (Logachöv), Lucky Strike field – Azores. UNESCO.

**ACHIEVEMENTS**

**1 - Description of Recent Research Activities**

Sulphide mineralogy and mineral geochemistry of unusual mineralizations related to ancient and modern volcanogenic massive sulphide deposits and their metallogenetic significance: The Neves Corvo and The PACMANUS Deposits.

Time evolution of mine tailings and their environmental impact: rates and mechanisms of concentration, liberation and migration of (low-grade) metals during weathering.

Characterisation of crucial mineral resources for the development of renewable energy technologies: The Iberian Pyrite Belt ores as a source of indium and other high-technology elements.

Science Divulgation – Promoting knowledge and education on science and technology through the “Ciência Viva” program – Centro Ciência Viva do Lousal – Mina de Ciência, which is a cultural and scientific mining museum. The general idea consists of taking advantage of an old mine infrastructure to use the concept of Georesources as a window opened through a wide range of fields of knowledge that include natural and exact sciences, applied technologies and several fields of engineering.

**2 - Selected Publications:**

DPS de Oliveira, JX Matos, CJP Rosa, DRN Rosa, MO Figueiredo, TP Silva,
F Guimarães, JRS Carvalho, AMM Pinto, JRMS Relvas, and FKM Reiser (2011) – The Lagoa Salgada Orebody, Iberian Pyrite Belt, Portugal ©2011 Society of Economic Geologists, Inc. Economic Geology, v. 106, pp. 1111–1128.

Matos, J.X.; Martins, A.; Rego, M.; Mateus, A.; Pinto, A.; Figueiras, J.; Silva, E. (2011) - Roman slag mine wastes distribution in the Portuguese sector of the Iberian Pyrite Belt. Actas V Cong. Int. Minería y Metalurgia Históricas SW Europeo, León, Libro Homenaje a Claude Domergue, Eds. J.M. Mata-Perelló, L.T. Iabat, M.N.F. Prieto, SEDPGYM Spain, 563-572 pp.

Fiona K.M. Reiser, Diogo R.N. Rosa, Álvaro M.M. Pinto, João R.S. Carvalho, João X. Matos, Fernanda M.G. Guimarães, Luís C. Alves and Daniel P.S. de Oliveira (2011) – Mineralogy and geochemistry of tin- and germanium-bearing copper ore, Barrigão re-mobilized vein deposit, Iberian Pyrite Belt, Portugal. International Geology Review
Vol. 53, No. 10, 20 August 2011, 1212–1238.

A. Mateus, A. Pinto, L.C. Alves, J.X. Matos, J. Figueiras and N.R. Neng, (2011) – Roman and modern slag at S. Domingos mine (IPB, Portugal): compositional features and implications for their long-term stability and potential re-use. International Journal of Environment and Waste Management, Vol. 8, Nos. 1/2, 2011, pp. 133-159.

Jorge MRS Relvas, Fernando JAS Barriga, João RS Carvalho, Álvaro MM Pinto, João X Matos, Carlos JP Rosa, Zélia Ribeiro (2011) - Structure, stratigraphy and hydrothermal alteration at the Gavião orebodies, Aljustrel: reconstruction of a dismembered ore-forming system at the Iberian Pyrite Belt and implications for exploration. In F. Barra et al. (eds), Let's Talk Ore Deposits Published by Ediciones Universidad Católica del Norte, Antofagasta, Chile, ISBN 9789562873291: 772 – 774.AMM Pinto, JMRS Relvas, FJAS Barriga, N Pacheco, 2010 – Neves Corvo ores: where under the seafloor can we find similar? Ciência 2010. Lisboa. Julho de 2010.

J.X. Matos; A. Mateus; A. Martins; A. Pinto; J. Figueiras, 2010 – Roman slag characteristics and distribution in the Portuguese segment of the Iberian Pyrite Belt. VI Simpósio da SEDPGYM, Vila Velha de Ródão, Maio de 2010.

Fiona K.M. Reiser, Diogo R.N. Rosa, Álvaro M.M. Pinto, João R.S. Carvalho, João X. Matos, Fernanda M.G. Guimarães, Luís C. Alves and Daniel P.S. de Oliveira, 2010 – Mineralogy and geochemistry of tin- and germanium-bearing copper ore, Barrigão re-mobilized vein deposit, Iberian Pyrite Belt, Portugal. International Geology Review. 2010, iFirst article, 1–27.

Fiona K. M. Reiser, Fernanda M. G. Guimarães, Álvaro M. M. Pinto, João X. Matos, João R. S. Carvalho, Daniel P. S. de Oliveira, Diogo R. N. Rosa, 2009 – Germanium-rich Chalcopyrite from the Barrigão Remobilised Vein Deposit, Iberian Pyrite Belt, Portugal. 10th SGA Biennial Meeting - "Smart Science for Exploration and Mining". 17th-20th August, 2009. Townsville, Australia.

Jorge MRS Relvas, Raul CGS Jorge, Álvaro MM Pinto, João Carvalho, Ana FA Marques, Miguel Gaspar, Fernando JAS Barriga, Carlos Rosa, 2009 – Iberian Pyrite Belt: recent insights and advances. 10th SGA Biennial Meeting - "Smart Science for Exploration and Mining". August, 2009. Townsville, Australia.

J. Tomás Oliveira, Jorge M.R.S. Relvas, Zélia Pereira, João X. Matos, Carlos J.Rosa, Diogo Rosa, José M. Munhá, Raúl C.G.S. Jorge, Álvaro M.M. Pinto, 2008 - Geologia da Zona Sul Portuguesa, com ênfase na estratigrafia e na vulcanologia física, geoquímica e mineralizações da Faixa Piritosa.

M. Benzaazoua; P. Marion; F. Robaut and A. Pinto, 2007 – Gold-bearing arsenopyrite and pyrite in refractory ores: analytical refinements and new understanding of gold mineralogy. Mineralogical Magazine, April 2007, Vol. 71(2), pp. 123–142.

A. Pinto , A. Mateus, L. Cerqueira Alves, J.X. Matos, N. Neng, J. Figueiras, 2007 – Detailed slag characterization relevance in environmental and economic assessments; the example of São Domingos (Iberian Pyrite Belt, Portugal). XXV Semana de Geoquímica. UTAD – Universidade de Trás-os-Montes e Alto Douro. Vila Real, 16-21 Julho 2007.

R.C.G.S. Jorge, A.M.M. Pinto, C.C.G. Tassinari, J.M.R.S. Relvas and J. Munhá, 2007 - VHMS metal sources in the Iberian Pyrite Belt: new insights from Pb isotope data. 9th SGA Biennial Meeting - "Mineral Exploration and Research: Digging Deeper". 20th-23rd August, 2007. Trinity College Dublin, Ireland.

A.M.M. Pinto, J.M.R.S. Relvas, F.J.A.S. Barriga, J. Munhá, N. Pacheco and S.D. Scott, 2005. Gold Mineralization in Recent and Ancient Volcanic-Hosted Massive Sulfides: the PACMANUS Field and the Neves Corvo Deposit. 8th Biennial SGA Meeting – Mineral Deposit Research: Meeting the Global Challenge, Vol. 1, Chapter 6-22, pp. 683 - 686, Mao and Bierleing (Eds.), 2005. Springer-Verlag Berlin Heidelberg, ISBN 3-540-27945-8.

Ana P. Jesus, António Mateus, José Munhá, Álvaro Pinto, 2005. Intercummulus massive Ni-Cu-Co and PGE-bearing sulphides in pyroxenite: a new mineralization type in the layered gabbroic sequence of the Beja Igneous Complex (Portugal). 8th Biennial SGA Meeting – Mineral Deposit Research: Meeting the Global Challenge, Vol. 1, Chapter 4-14, pp. 405 - 407, Mao and Bierleing (Eds.), 2005. Springer-Verlag Berlin Heidelberg, ISBN 3-540-27945-8.

Pinto, A.M.M., Barriga, F.J.A.S., and Scott, S.D., 2004. Data report: Sulfide and oxide mineral chemistry of an active backarc hydrothermal system: PACMANUS, ODP Holes 1188A, 1188F, 1189A, and 1189B. In Barriga, F.J.A.S., Binns, R.A., Miller, D.J., and Herzig, P.M. (Eds.), Proc. ODP, Sci. Results, 193, 1–31 [Online]. Available from World Wide Web:
http://www-odp.tamu.edu/publications/193_SR/VOLUME/CHAPTERS/203.pdf

Pinto, A., JFW Bowles, M Benzaazoua, P. Marion, A. Ferreira and FJAS Barriga, 2004. Gold Mineralization at the Neves Corvo Ore Deposit, Portugal. 32nd International Geological Congress, Florence.

A. M. M. Pinto, F. J. A. S. Barriga, S. D. Scott, S. Roberts, 2003. PACMANUS: The subsurface sulfide/oxide/gold mineralization. 7th Biennial SGA Meeting - Mineral Exploration and Sustainable Development, Eliopoulos et.al. (eds) © 2003 Millpress, Rotterdam, ISBN 90 77017 77 1.

Benzaazoua, M.; Marion, P.; Pinto, A.; Migeon, H. and Wagner, F. E. (2003) - Tin and indium mineralogy within selected samples from the Neves-Corvo ore deposit (Portugal): A multidisciplinary study. Minerals Engineering, Vol 16, Issue 11, Suplement 1 Applied Mineralogy, Pages 1237-1325. Edited by B. A. Wills. November 2003.

Barriga FJAS, R. Binns, DJ Miller and Shipboard Scientific Party (includes Alvaro MM Pinto), 2002. Treasure in the making under the sea floor. ODP Highlights – International Contributions to the ODP Program, pp 8-9. http://joiscience.org/GreatestHits2/pdfs/barriga.pdf

M. Benzaazoua, P. Marion, L. Liouville-Bourgeois, R. Joussemet, R. Houot, A. Franco and A. Pinto (2002). Mineralogical distribution of some minor and trace elements during a laboratory flotation processing of Neves-Corvo ore (Portugal). International Journal of Mineral Processing, Volume 66, Issues 1-4, September 2002, Pages 163-181.

Binns RA, FJAS Barriga, DJ Miller and the Leg 193 Scientific Party (includes Alvaro MM Pinto), 2002. Anatomy of an Active Hydrothermal System Hosted by Felsic Volcanic Rocks at a Convergent Plate Margin: ODP Leg 193. Joides Journal 28(2):2-7.
http://joides.rsmas.miami.edu/files/jj_vol_28_2.pdf

Relvas JMSR, FJAS Barriga, A.M.M. Pinto, A Ferreira, N Pacheco, P Noiva, G Barriga, R Baptista, D Carvalho, V Oliveira, J Munhá, RW Hutchinson, 2002. The Neves Corvo deposit, Iberian Pyrite Belt, Portugal: impacts and future, 25 years after the discovery. SEG Special Publications 9:155-176

Shipboard Scientific Party, 2001 – Leg 193; Initial Reports Volume 193: Anatomy of an Active Felsic-Hosted Hydrothermal System, Eastern Manus Basin. Sites 1188 – 1191 7 November 2000 – 3 January 2001. National Science Foundation – Joint Oceanographic Institutions, Inc. January 2002. Available from World Wide Web: http://www-odp.tamu.edu/publications/193_IR

Shipboard Scientific Party, 2001. Leg 193 Preliminary Report: Anatomy of an Active Felsic-Hosted Hydrothermal System, Eastern Manus Basin. ODP Prelim. Rpt., 193 [Online]. Available from World Wide Web. http://www-odp.tamu.edu/publications/prelim/193_prel/193prel.pdf

Ferreira, P., **A. Pinto**, B. Murton, H. Monteiro, V. Magalhães, E. Salgueiro, C. Rodrigues, R.Quartau & A. Stepanov – 2001 – Hydrothermal Geological Materials From Lucky Strike Field Collected During TTR-10/Leg 2, Azores, Mid-Atlantic Ridge. Geological Processes on Deep Water European Margins, International. Conference and 10th Anniversary TTR Post-Cruise Meeting, Intergovernamental Oceanographic Commission, Workshop Report No. 175, pp 74-76, UNESCO 2001.

Gaspar, O., & **Pinto, A.,** (1991) – The ore textures of the Neves Corvo volcanogenic massive sulphide and their implications for ore beneficiation. Mineralogical Magazine, Vol. 55: 417 – 422.

**3 - Oral Communications by Invitation**

Álvaro Pinto, 2008 – Sub Seafloor Metals - Gold Mineralization in Recent and Ancient Volcanic-Hosted Massive Sulphides: PACMANUS Field and Neves Corvo Deposit. CREMINER (LA-ISR), University of Lisbon. In INETI Lisbon.

Pinto, Álvaro M. M., 2006 – "Applied Mineralogy – Knowledge "over the past" to Challenge the Future, 2006". CREMINER (LA-ISR), University of Lisbon. In Pos-Graduation studies GeoFCUL.

Pinto, Álvaro M. M. and Barriga, F.J.A.S., 2004 – A Aventura das Rochas no Oceano Profundo. In Centro de Formação da Escola Secundária de Rio Maior. Rio Maior – February, 2004.

Pinto, Álvaro M. M. and Barriga, F.J.A.S., 2004 – À Descoberta do Vulcanismo nos Fundos Oceânicos. In Escola EB2,3 e Secundário El-Rei D. Manuel I, Alcochete – Semana Cultural 16, 17 e 18 de Março de 2004.

Pinto, A., and Relvas J. M. S. R., 2003 – Iberian Pyrite Belt – Province of Giant VMS Deposits – The Neves Corvo Case. In Kordi - Korea Ocean Research and Development Institute at Ansan (Seoul) KOREA – January, 2003.

**4 - Project Evolvement**

"Volcanic Architectures, metal reservoirs and hybrid meallogenesis in the Iberian Pyrite belt – ARCHYMEDES II" (SAPIENS 2002 – nº 45873, Principal Researcher: Jorge M.R.S. Relvas – Start - September 2005).

"Metaltravel - Time evolution of mine tailings and their environmental impact: rates and mechanisms of concentration, liberation and migration of (low-grade) metals during weathering". FCT – Fundação para a Ciência e Tecnologia POCI/CTE-GEX/61700/2004, Principal Researcher: Jorge Figueiras – Start January 2006).

"INCA: Characterisation of crucial mineral resources for the development of renewable energy technologies: The Iberian Pyrite Belt ores as a source of indium and other high-technology elements." – INCA – Projecto da FCT – Fundação para a Ciência e Tecnologia PTDC/CTE-GIN/67027/2006, Principal Researcher: Diogo Raeymaekers N. Rosa.

Technical support for special mineral sample preparation in the project:
"Condutas sedimentares profundas da margem oeste portuguesa." – DEEPCO – Projecto da FCT – Fundação para a Ciência e Tecnologia POCTI/CTA/46367/2002. Instituição Proponente: Instituto Hidrográfico; Outras instituições Participantes: MNHN (CGUL), FFCUL, IPIMAR; Coordenação: AR Bizarro (IH).

**5 - Organization of Scientific Technical International Meetings and Conferences**

Member of the Organizing Committee of the International MoMAR Implementation Workshop, Lisbon, Portugal, 7-9 April, 2005.

IODP (Integrated Ocean Drilling Program) – Operations Task Force Meeting, Lisbon, Portugal, March, 2005.

National Representative of Portugal for the internacional ICAM 2004 – Brazil – 8th International Congress on Applied Mineralogy, September 19 – 22, 2004.

**6 - Awards**

SEG FOUNDATION AWARDS 2004 - Hugh E. McKinstry Student Research Awards are granted to students whose projects involve studies of mines or ore districts; topical studies toward improved understanding of ore genesis; and experimental research with field applications. Alvaro M.M. Pinto, $2,000, Universidade de

Lisboa, Ph.D., Mineralogical and geochemical comparison of the Neves Corvo and Pacmanus ore-forming systems.

8th SGA Meeting – Grant, 2005 - US$950 to participate and to present submitted oral presentation in 8th Biennial Meeting of the Society for Geology Applied to Mineral Deposits, 18 - 21 August, 2005 Beijing, China.

Internacional 8th SGA – Beijing 2005 – Field Trip Grant – US$ 650 equivalent to the cost of participation in "Porphyry-skarn-stratabound Cu-Au-Mo deposits of the Middle and Lower Yangtze River region, China: Xinqiao, Dongguashan, Shizishan, Anqing, Chenmenshan, and Wushan deposits". 22 – 27, August, 2005, China.

**Internationalization and Partnership**

UNIVERSITY OF TORONTO, CANADA
Professor Steven D. Scott
Professor Mike Gorton
Drª Liu Yanan

KORDI – KOREA OCEAN RESEARCH & DEVELOPMENT INSTITUTE
Professor Sang-Mook Lee

SNU – SEOUL NATIONAL UNIVERSITY, SCHOOL OF EARTH AND ENVIRONMENTAL SCIENCES (SEES)
Professor Sang-Mook Lee

OPEN UNIVERSITY
DEP. EARTH SCIENCES, MILTON KEYNES, UNITED KINGDOM
Doctor John Bowles (Mineral Science, Lda,)

INSTITUT NATIONAL POLYTECHNIQUE DE LORRAINE (I.N.P.L.)
LEM LABORATOIRE ENVIRONNEMENT ET MINÉRALURGIE
Doctor Phillipe Marion

UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE (UQAT)
CAMPUS DE ROUYN-NORANDA
Doctor Mostaka Benzaazoua