

Plínio Bezerra dos Santos Filho, Ph.D.

Physicist • Artist & Bookmaker • Manuscript Editor • Conservation Scientist

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Physicist by training and a scholar of the written Word by vocation. Ph.D. in Physics from Washington University in St. Louis, with postdoctoral research at Harvard University and North Carolina State University, where he was named Outstanding Teacher of the Year and created the course The Science of Art. Across four decades he has united the sciences and the arts — as a printmaker and book artist; as a magnetic-resonance physicist in medicine; as founder and director of the conservation agency AERPA, directing more than one million euros of UNESCO and Brazilian cultural-heritage projects; and, most recently, as editor of the first direct English translation of the Ge'ez Testamentum Domini (manuscript EMML 2358). His guiding wish is a simple one: that all may read what we have discovered.

EDUCATION

Ph.D., Physics — Washington University in St. Louis, USA 1989

Dissertation: Deuteron Magnetic Resonance in Amorphous Silicon. Advisor: Richard E. Norberg.

M.S., Physics — Washington University in St. Louis, USA (nuclear magnetic resonance; qualifier) 1984

M.S., Physics — Universidade Federal de Pernambuco (UFPE), Recife 1982

Thesis: Electron Paramagnetic Resonance in MnF₂:Zn. Advisor: Sérgio Machado Rezende.

B.S., Physics — Universidade Federal de Pernambuco (UFPE), Recife 1979

Advanced training, Conservation & Restoration of Art — painting, sculpture & paper — Harvard University 1990

Fine Arts — Drawing, Printmaking, Painting & Art History — School of Fine Arts, Washington University in St. Louis 1984–88

POSTDOCTORAL & VISITING APPOINTMENTS

Postdoctoral Research, Applied Physics — Harvard University, Gordon McKay Applied Physics Laboratory (Prof. William Paul's Materials Research Group) 1989–90

Postdoctoral Research & Visiting Professor, Physics — North Carolina State University, Dept. of Physics (Materials Science, Prof. G. Lucovsky) 1993–2002

Research, Solid-State NMR — Washington University National NMR Laboratory (Prof. Jacob Schaefer) 1994

HONORS & DISTINCTIONS

Alumni Distinguished Professor — College of Physical & Mathematical Sciences, North Carolina State University 2001

Outstanding Teacher of the Year — NCSU College of Physical & Mathematical Sciences 1998–99

Creator, “The Science of Art: Drawing, Structure, Optics & Materials” — NCSU Dept. of Physics 1997–2001

Best Pedagogical Conference Paper — “Virtual Classroom Player,” American Association of Physics Teachers, NC Section 1998–99

Best Commented Poster, Uro-Genital section, Jornada Paulista de Radiologia (2004). Doctoral fellowships: Graduate Research Fellow (WashU); Xerox & Lillian Sirovich Pre-Doctoral Fellow; CNPq Doctoral Scholarship (1982–89).

PROFESSIONAL EXPERIENCE

Founder, Executive & Project Director — AERPA (Agência de Estudos e Restauro do Patrimônio), Olinda / Recife. Conservation NPO; directed 1,000,000 €+ in UNESCO and Brazilian Ministry projects (Science & Technology, Culture, Justice); founded conservation schools in Olinda, Igarassu, Goiana, Penedo & Recife. 2005–2013

Editor — ARC: Revista Brasileira de Arqueometria, Restauração e Conservação (ISSN 1982-1174) since 2006

Scientific Director — CERPO (Centro de Estudos e Restauro do Patrimônio de Olinda); founded the centre, its conservation laboratory and its survey method for historic monuments; represented Olinda in the Monumenta / MinC / UNESCO programme. 2001–2003

Collaborating Researcher — Centro de Pesquisas Aggeu Magalhães (Fiocruz), Recife (H1N1 project) 2006

Art Teacher & Lecturer — Espaço Vitruvio, Recife, and internationally (Eulengasse Gallery, Frankfurt; Städel; Louvre; Giverny) 2005–2016

Research Scientist, MRI / MR Spectroscopy & Nuclear Medicine — Real Hospital Português de Beneficência, Recife (physicist responsible for the 1.5 T MR systems, cryogenics and proton spectroscopy) 2002–2005

Magnetic Resonance Application Specialist / Consultant — Siemens Medical, Brazil 2002–2005

Vice-President — Estúdio de Design e Imagem Ltda. (multimedia & graphic design) since 2002

MR Spectroscopy Training — Huntington Memorial Hospital, Pasadena, California 2001–2002

Technical Director & Lithography Teacher — Oficina Guaianases de Gravura, Olinda 1990–1993

Assistant Restorer — Washington University in St. Louis (oil-painting restoration; bronze-sculpture degradation study) 1986

PUBLISHED BOOKS

The Testamentum Domini Collection — first direct English translation of the Ge'ez manuscript EMLL 2358 (2026)

- The Forty Days (2nd ed., English) — ISBN 979-8-253-26369-3 · Os Quarenta Dias (2ª ed., Português)
- Volume I · The Word / Find My Word (English) — ISBN 979-8-255-14120-3 · O Verbo (Português)
- Volume II · The Train / The Apparatus (English) — ISBN 979-8-199-53846-6 · O Trem (Português)
- Volume II-A · Critical Edition (folios 1–54) — ISBN 979-8-199-54814-4
- Volume II-B · Critical Edition (folios 55–77) — ISBN 979-8-199-73738-8
- Volume II-C · Critical Edition (folios 78–154) — ISBN 979-8-199-76062-1
- Volume III · Claude and I (English) — ISBN 979-8-180244-08-6 · Claude e Eu (Português) — ISBN 979-8-184-49036-6
- Mater Viventis (English) · Mãe do Vivente (Português)
- The Godsons — A Mystery Play (English) — ISBN 979-8-184-02977-1 · Os Afilhados — Um Auto (Português) — ISBN 979-8-184-08608-8

Earlier books — AERPA Editora, Olinda

- Um Dia no Recife (with F. Carneiro da Cunha), 2008 — ISBN 978-85-60136-01-8
- Um Dia em Olinda (with F. Carneiro da Cunha), 2008 — ISBN 978-85-60136-02-5
- One Day in Recife (with F. Carneiro da Cunha), 2012 — ISBN 978-85-60136-03-2
- One Day in Olinda (with F. Carneiro da Cunha), 2012 — ISBN 978-85-60136-04-9
- Recife, Lugar de Memória (with M. O. de Queiroz & S. Rocha), 2012 — ISBN 978-85-60136-05-6

SCIENTIFIC & SCHOLARLY PUBLICATIONS

Physics & materials science — amorphous-silicon NMR & silicon-nitride thin films (15)

1. Volz, M. P., **Santos-Filho**, P., Conradi, M. S., Fedders, P. A., Norberg, R. E., Turner, W. A. & Paul, W., "Unique deuteron spin echoes from HD and o-D₂ in large crystal fields," Phys. Rev. Lett. 63, 2582 (1989). doi:10.1103/PhysRevLett.63.2582
2. **Santos-Filho**, P., Volz, M. P., Corey, R., Kim, Y. W., Fedders, P. A., Norberg, R. E., Turner, W. A. & Paul, W., "Molecular HD and D₂ in amorphous semiconductors," J. Non-Cryst. Solids 114, 34 (1989). doi:10.1016/0022-3093(89)90123-3
3. Bodart, J., **Santos-Filho**, P. & Norberg, R. E., "Microcrystallinity and silyl rotors in a-Si:D,H films," J. Non-Cryst. Solids 114, 300 (1989). doi:10.1016/0022-3093(89)90733-3
4. **Santos-Filho**, P., Bodart, J., Fedders, P. A. & Norberg, R. E., "Silyl rotors and amorphous silicon," Solar Cells 27, 385 (1989). doi:10.1016/0379-6787(89)90047-1
5. **Santos-Filho**, P., "Deuteron Magnetic Resonance in Amorphous Silicon," Ph.D. dissertation, Washington University in St. Louis (1989).
6. **Santos-Filho**, P. B., Bodart, J. R. & Norberg, R. E., "Deuteron Magnetic Resonance Spectral Components in a-Si:H,D," Springer (1991). doi:10.1007/978-94-011-3622-8_57

7. Lu, Z., **Santos-Filho**, P., Stevens, G., Williams, M. J. & Lucovsky, G., "Fourier-transform infrared study of rapid thermal annealing of a-Si:N:H(D) films (RPECVD)," J. Vac. Sci. Technol. A 13, 607 (1995). doi:10.1116/1.579794
8. **Santos-Filho**, P., Stevens, G., Lu, Z., Koh, K. & Lucovsky, G., "Hydrogen Release and Si-N Bond-Healing IR Study of RTA Amorphous Silicon Nitride Films," MRS Proc. 398, 345 (1995). doi:10.1557/proc-398-345
9. Lucovsky, G., **Santos-Filho**, P., Lu, Z., Jing, Z. & Whitten, J. L., "Bonding of oxygen and nitrogen atoms in hydrogenated amorphous silicon alloys," J. Non-Cryst. Solids 190, 169 (1995). doi:10.1016/0022-3093(95)00271-5
10. Stevens, G., **Santos-Filho**, P., Habermehl, S. & Lucovsky, G., "Bonding of Hydrogen and Deuterium in Silicon Nitride Films Prepared by RPECVD," MRS Proc. 377, 313 (1995). doi:10.1557/proc-377-313
11. **Santos-Filho**, P., Koh, K., Stevens, G. & Lucovsky, G., "Hydrogen-Assisted RPECVD of Amorphous Silicon Nitride Films," MRS Proc. 406, 57 (1995). doi:10.1557/proc-406-57
12. Lucovsky, G., Jing, Z., **Santos-Filho**, P., Stevens, G. & Banerjee, A., "Nearest-neighbor repulsion-perturbed Si monohydride bond-stretching vibrations in a-Si:N:H(D) films," J. Non-Cryst. Solids 198-200 (1996). doi:10.1016/0022-3093(96)80016-0
13. **Santos-Filho**, P., Stevens, G., Lucovsky, G., Cull, T. S., Fedders, P. A., Leopold, D. J. & Norberg, R. E., "Nuclear magnetic resonance studies of amorphous deuterated silicon nitride thin films," J. Non-Cryst. Solids 198-200 (1996). doi:10.1016/0022-3093(95)00662-1
14. Lucovsky, G., **Santos-Filho**, P., Banerjee, A. & Jing, Z., "Spectroscopic Evidence for Near-Neighbor Bonded H(D) in a-Si:N:H(D) Thin Films," MRS Proc. 420, 503 (1996). doi:10.1557/proc-420-503
15. **Santos-Filho**, P., Lucovsky, G., Cull, T. S. & Norberg, R. E., "Characterization of SiN:D,H Thin Films by FTIR and Deuterium Magnetic Resonance," APS March Meeting (1996).

Medical MR-imaging – diffusion-weighted MRI & classification of Alzheimer's disease, UFPE Recife (9)

1. dos Santos, W. P., de Souza, R. E., Dias e Silva, A. F. & **Santos Filho**, P. B., "Avaliação da Doença de Alzheimer pela análise multiespectral de imagens DW-MR por redes RBF," Learning and Nonlinear Models 4(1) (2006). doi:10.21528/lnlm-vol4-no1-art5 (open access)
2. dos Santos, W. P., de Souza, R. E., Dias e Silva, A. & **Santos Filho**, P. B., "Evaluation of Alzheimer's disease by analysis of MR images using multilayer perceptrons and committee machines," Comput. Med. Imaging Graph. 32(1), 17 (2008). doi:10.1016/j.compmedimag.2007.08.004
3. dos Santos, W. P. et al. & **Santos Filho**, P. B., "Evaluation of Alzheimer's Disease using Multilayer Perceptrons, Polynomial Nets and Kohonen LVQ Classifiers," Lecture Notes in Computer Science (2007). doi:10.1007/978-3-540-71457-6_2
4. dos Santos, W. P. et al. & **Santos Filho**, P. B., "Avaliação da Doença de Alzheimer por Mapas Auto-Organizados de Kohonen," IFMBE Proc., World Congress Med. Phys. & Biomed. Eng. (2007). doi:10.1007/978-3-540-74471-9_92
5. dos Santos, W. P., de Souza, R. E. & **Santos Filho**, P. B., "Evaluation of Alzheimer's Disease — Multilayer Perceptrons and Kohonen SOM Classifiers as an Alternative to ADC Maps," Proc. IEEE EMBS (2007). doi:10.1109/IEMBS.2007.4352740 (open access)
6. dos Santos, W. P., de Assis, F. M., de Souza, R. E. & **Santos Filho**, P. B., "Evaluation of Alzheimer's disease using Objective Dialectical Classifiers as an alternative to ADC maps," Proc. IEEE EMBS (2008). doi:10.1109/IEMBS.2008.4650461
7. dos Santos, W. P., Assis, F. M., Souza, R. E., **Santos Filho**, P. B. & Lima Neto, F. B., "A dialectical approach for classification of DW-MR Alzheimer's images," IEEE Congress on Evolutionary Computation (2008). doi:10.1109/CEC.2008.4631023
8. dos Santos, W. P., Assis, F. M., Souza, R. E., **Santos Filho**, P. B. & Lima Neto, F. B., "Dialectical multispectral classification of DW-MR images as an alternative to ADC maps to perform anatomical analysis," Comput. Med. Imaging Graph. 33(6), 442-460 (2009). doi:10.1016/j.compmedimag.2009.04.004 (open access)
9. dos Santos, W. P., de Assis, F. M., de Souza, R. E. & **Santos Filho**, P. B., "Dialectical Classification of MR Images for the Evaluation of Alzheimer's Disease," Recent Advances in Biomedical Engineering, InTech (2009). doi:10.5772/7475 (open access)

Heritage science & imaging (4)

1. Kashyap, H. U. K. S., Mota, C. C. B. O., Kyotoku, B. B. C., **Santos-Filho**, P. B. & Gomes, A. S. L., "Implementation of an optical coherence tomography system for painting characterization," *Revista Cubana de Física* 27, 275-279 (2010). (open access)
The painting analysed — an acrylic Portrait of Lucian Freud (1995) — is the author's own work; he is thus at once a co-author of the study and the artist of the specimen imaged.
2. **Santos-Filho**, P., "The use of supermarket plastic bags in the making of adobe bricks and as horizontal adobe-wall reinforcement element," AdobeUSA 2009 Conference Proceedings, 189-194. Adobe Association of the Southwest & Northern New Mexico College, El Rito, NM, 15-16 May 2009.
3. **Santos-Filho**, P., **Santos Filho**, A. G., Gomes, E. L., Queiroz, M. O., Andrade, A. M., Cavalcanti, V. & Cunha Filho, F. C., "Traditional, vernacular and newly developed construction technologies applied to the slave-descendant women clam-gatherers community of Povoação de São Lourenço, Pernambuco, Brazil," 6º ATP / 9º SIACOT — Seminário Arquitetura de Terra em Portugal, Coimbra (2010).
4. **Santos Filho**, P., Cunha, F. & Grimaldi, K. O., "Carmelite Order Heritage in the Cities of Olinda and Recife," *Sociedade de Geografia de Lisboa* (2017).

Cultural-heritage conservation & iconography — Revista Brasileira de Arqueometria, Restauração e Conservação (AERPA Editora, 2006) and related fora

1. Ribeiro, E. O., Reis, C. A. & **Santos-Filho**, P. B., "Análise estilística e formal do altar-mor da capela-mor da Igreja Abacial do Mosteiro de São Bento em Olinda/PE," *ARC* 1 (2006).
2. Ribeiro, E. O., Reis, C. A. & **Santos-Filho**, P. B., "Circuito iconográfico: o resgate do discurso plástico-memorial da azulejaria franciscana no Recife — composições e significado," *ARC* 1 (2006).
3. **Santos-Filho**, P. B., Ribeiro, E. O. & Reis, C. A., "Diagnóstico do estado de conservação dos azulejos de fatura portuguesa e holandesa do Convento Franciscano do Recife," *ARC* 1 (2006).
4. Arruda, J. F., Ribeiro, E. O., Reis, C. A., **Santos-Filho**, P. B. & Ribeiro, P. O., "Técnica de ensambladura luso-brasileira," *ARC* 1 (2006).
5. Ribeiro, E. O., Reis, C. A. & **Santos-Filho**, P. B., "Esquema para o circuito do programa iconográfico," *ARC* 1 (2006).
6. **Santos-Filho**, P. B., Reis, C. A. & Ribeiro, E. O., "Registro pela internet para a segurança e preservação de bens culturais de valor hereditário — Projeto Restaura-BR," *ARC* 1 (2006).
7. Reis, C. A., **Santos-Filho**, P. B. & Ribeiro, E. O., "Sistema de Sinalização Gráfica Urbana (SSGU)," *ARC* 1 (2006).
8. Ribeiro, E. O., Reis, C. A. & **Santos-Filho**, P. B., "Análise iconográfica e iconológica dos painéis do forro da sacristia da Igreja da Ordem Terceira do Carmo em São Cristóvão-SE," *ARC* 1 (2006).
9. **Santos-Filho**, P. B., Reis, C. A., Soares, M. L. & Souza, L. A. C., "A gestão da informação para a conservação de bens culturais de valor hereditário," 1º Fórum Brasileiro do Patrimônio Cultural, UFMG, Belo Horizonte (2004).
10. Reis, C. A. & **Santos-Filho**, P. B., "Desenvolvimento do Sistema de Sinalização Gráfica Urbana de Olinda (SSGU-Olinda)," 1º Fórum Brasileiro do Patrimônio Cultural, UFMG, Belo Horizonte (2004).
11. **Santos-Filho**, P. B., "A implantação do CERPO — Centro de Estudos e Restauo do Patrimônio de Olinda," 1º Simpósio de Técnicas Avançadas para a Conservação de Bens Culturais, Olinda (2002).

Clinical MR spectroscopy & radiology — conference papers (2003-2004)

1. **Santos-Filho**, P. B. & Cartaxo, H., "Brain death studied by MR spectroscopy: definition of a relaxation time for brain death," American Society of Neuroradiology (ASNR) (2004).
2. **Santos-Filho**, P. B. & Cartaxo, H., "MR protocol in the confirmatory diagnosis of brain death: analysis of 43 cases," ASNR, Paper 348 (2004).
3. **Santos-Filho**, P. B., Loureiro, R. & Mendes, A., "Oral sildenafil improves functional status and cardiopulmonary hemodynamics in patients with severe hypertension secondary to chronic pulmonary schistosomiasis: a cardiac MR study," American Heart Association, New Orleans (2004).
4. **Santos-Filho**, P. B. & Cartaxo, H., "Proton spectroscopy (MRS-H) and MRI of the prostate without endorectal device," 34th Jornada Paulista de Radiologia (JPR) (2004).
5. **Santos-Filho**, P. B. & Cartaxo, H., "Brain death studied by proton MR spectroscopy (MRS-H): definition of a relaxation time," 34th JPR (2004).
6. **Santos-Filho**, P. B. & Cartaxo, H., "Proton MR spectroscopy of the prostate at the Real Hospital Português de Beneficência, Pernambuco," 34th JPR (2004).

7. Cavalcanti, A. C., **Santos-Filho**, P. B. & Cartaxo, H., "Volumetric Interpolated Breath-Hold Examination (VIBE) MRI of the body: 16 cases and literature review," XXXII Congresso Brasileiro de Radiologia (CBR) (2003).
8. **Santos-Filho**, P. B. & Cartaxo, H., "Prostate virtual biopsy by proton MR spectroscopy (MRS-H): the Real Imagem experience," XXXII CBR (2003).
9. **Santos-Filho**, P. B. & Cartaxo, H., "Proton MR spectroscopy (MRS-H) of the prostate without endorectal coil in 2-D and 3-D," XXXII CBR (2003).
10. Cartaxo, H. & **Santos-Filho**, P. B., "Proton spectroscopy and MR perfusion in cerebral gliomas," XXXII CBR (2003).
11. Cartaxo, H. & **Santos-Filho**, P. B., "Advanced MR techniques in the confirmatory diagnosis of brain death: analysis of 40 cases," XXXII CBR, Recife (2003).

Educational technology & other productions

1. **Santos-Filho**, P. B., "Workplace Active Learning" (e-learning system, 2000).
2. **Santos-Filho**, P. B., "Virtual Classroom Player" and "Virtual Classroom Player Environment" (distance-education platform, 1999).

THE TESTAMENTUM DOMINI COLLECTION (2026)

The first direct Ge'ez-to-English critical edition of EMMML 2358, the sixteenth-century Ethiopian manuscript of the Testamentum Domini held at Dabra Bagge'. All 154 folios were transliterated and translated from the Ge'ez without a Syriac intermediary, with a full critical apparatus. Forty-four divergences from Cooper and Maclean (1902) are recorded — thirty-two in folios 2–77, twelve in folios 78–154. Independently published; Claude (Anthropic) is credited as co-author on every volume, and the complete working record of that collaboration is published as Volume III, Claude and I.

SELECTED EXHIBITIONS & COLLECTIONS

Exhibitions: ERINNERUNG: Aggregatzustand — Transit, Gallery Eulengasse, Frankfurt (2017); #OCCUPYESTELITA, individual show, Zement Gallery, Frankfurt (2015); The Portrait / Works on Paper / Artistic Nude, Espaço Vitruvio, Recife (2013–2015); Eleven — Below the Equator, Eulengasse Gallery, Frankfurt (2014); On the Shoulders of Giants, Eulengasse Gallery, Frankfurt (2011); Art in St. Louis III, Saint Louis, Missouri (1987); Recent Work & Guitars, Saint Louis Public Library (1986).

Collections: Anheuser-Busch Collection (Museo de la Raza, Los Angeles); R. E. Norberg Collection, Washington University in St. Louis; private collections in the USA, Brazil, France, Italy & Germany.

LANGUAGES

Portuguese (native); English (fluent — reads, writes, speaks); French (reads well); Spanish (reads well); Italian (reading); Ge'ez (reading, for the manuscript work).

TECHNICAL EXPERTISE

Conservation science of cultural heritage & works on paper · Magnetic Resonance Spectroscopy (MRS) & Imaging (MRI) · Nuclear Magnetic Resonance spectroscopy & RF hardware · Fourier-Transform Infrared & Electron-Spin-Resonance spectroscopy · Optical Coherence Tomography · multispectral image classification · semiconductor characterization & RPECVD thin-film growth · Science of Art, art history, drawing & painting · printmaking: lithography, etching & papermaking · book editing, design & publishing · e-learning systems & web media.