

International Ocean Discovery Program (IODP),
Texas A&M University,
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Education

- 1990 - 1994 Ph.D., Geology and Geophysics, Edinburgh University, UK.
 Advisor: Prof. K.M. Creer. Title: "Paleomagnetic and magnetic records for the
 last 300,000 years from Lac du Bouchet, France: applications to
 geomagnetism and paleoenvironment."
- 1986 - 1989 B.Sc. (hons.), Geology and Geophysics, Durham University, UK.

Professional Experience

- Aug 2015 onward Assistant Research Scientist (IODP Staff Scientist I), International Ocean
Discovery Program (IODP), Texas A&M University.
- 2007 - July 2015 Research Scientist, Borehole Research Group (BRG), Lamont-Doherty Earth
Observatory (LDEO) of Columbia University, Palisades, NY 10964, U.S.A.
- 2004 - 2007 Associate Research Scientist, BRG-LDEO.
- 1999 - 2004 Senior Staff Associate, BRG-LDEO.
- 1995 - 1999 Research Associate, Dept. of Geology, University of Leicester, U.K.
- 1994 - 1995 Royal Society of London fellowship, Laboratoire de Géologie du Quaternaire,
CNRS, CEREGE, Aix-en-Provence, France. Advisor: Nicolas Thouveny
- 1990 Assistant geologist, Robertson Group plc., Llandudno, N. Wales, U.K.

Summary of Research Interests

Antarctic climate and ice history: ice sheet instability under past warm climates; sea level change;
provenance of ice-rafted debris and glacially eroded sediment; Antarctic subglacial geology.

Ocean drilling: the use of downhole geophysical logs and physical properties of marine sediment
cores for insight into paleoceanography, stratigraphy, and cyclicity; linking borehole data to
seismic profiles; downhole magnetic logging for magnetostratigraphy.

Warm climates of the Cretaceous and Eocene: ocean anoxic events; chert formation; long-term
climate change.

Current Projects

- Lead PI on the NSF project: Deglacial ice dynamics in the Weddell Sea embayment using sediment
provenance. Fieldwork to Foundation Ice Stream and Recovery Glacier, Antarctica, Dec. 2014.
- IODP Expedition 354, Bengal Fan, Himalayan uplift history. Science party member. Feb-Mar. 2015.
- Lead PI of IODP Proposal 813, Greenhouse to Icehouse Antarctic paleoclimate and ice history from
George V Land and Adélie Land shelf sediments. Scheduled for Feb-Mar. 2018.

Publications

(* indicates student first author)

In Press:

- J. Lofi, A. Voelker, E. Ducassou, F. J. Hernández-Molina, A. Bahr, A. Galvani, L. Lourens, F.J. Sierro, **T. Williams**. Quaternary record in the Gulf of Cádiz and Portuguese Contourite Depositional Systems. Marine Geology.
- F.J. Hernández-Molina, F.J. Sierro, E. Llave, C. Roque, D.A.V. Stow, **T. Williams**, J. Lofi, M. Van der Schee, A. Arnais, S. Ledesma, C. Rosales, F.J. Rodríguez-Tovar, E. Pardo-Igúzquiza, R.E. Brackenridge. Evolution of the Gulf of Cádiz Margin and west Portugal contourite depositional system: tectonic, sedimentary and paleoceanographic implications from IODP Expedition 339. Marine Geology.

Published:

47. *M. A. Hansen, S. Passchier, B.-K. Khim, B. Song, **T. Williams** (2015). Threshold Behavior of a Marine-Based Sector of the East Antarctic Ice Sheet in Response to Early Pliocene Ocean Warming. Paleoceanography, 30, 789–801, doi:10.1002/2014PA002704
46. C.-F. Li, J. Li, W. Ding, D. Franke, Y. Yao, H. Shi, X. Pang, Y. Cao, J. Lin, D. K. Kulhanek, **T. Williams**, and 27 other authors (2015). Seismic stratigraphy of the central South China Sea basin and implications for neotectonics. J. Geophys. Res. Solid Earth, 120, 1377-1399, doi:10.1002/2014JB011686.
45. *E.L. Pierce, S.R. Hemming, **T. Williams**, T. van de Flierdt, S.A. Brachfeld, G. Gehrels, S.L. Goldsetin, P.W. Reiners, and S.N. Thompson (2014). A comparison of detrital U-Pb zircon, $^{40}\text{Ar}/^{39}\text{Ar}$ hornblende, and $^{40}\text{Ar}/^{39}\text{Ar}$ biotite ages in marine sediments off East Antarctica: implications for the geology of subglacial terrains and provenance studies. Earth-Science Reviews, 138, p156-178, DOI: 10.1016/j.earscirev.2014.08.010
44. F. J. Hernández-Molina, D.A.V. Stow, C.A. Alvarez-Zarikian et al. (**T. Williams** and 32 other authors) (2014). Onset of Mediterranean Outflow into the North Atlantic. Science, 344, 1244 - 1250; DOI: 10.1126/science.1251306
43. **T. Williams** (2014), How Antarctic ice retreats. Nature News and Views article (June 6 2014), 509, doi:10.1038/nature13345
42. *C. P. Cook, D. Hill, T. van de Flierdt, **T. Williams**, S. R. Hemming, A. M. Dolan, E. L. Pierce, C. D. Escutia, D. Harwood, G. Cortese, J. J. Gonzales (2014). Sea surface temperature control on the distribution of far-travelled Southern Ocean ice-rafted detritus during the Pliocene. Paleoceanography, doi: 0.1002/2014PA002625
41. F.J. Hernández-Molina, D. Stow, C. Alvarez-Zarikian, and Expedition IODP 339 Scientists, (2013), IODP Expedition 339 in the Gulf of Cadiz and off West Iberia: decoding the environmental significance of the Mediterranean outflow water and its global influence. Scientific Drilling, No. 16, Dec 2013, 1–11, 2013. doi:10.5194/sd-16-1-2013
40. G. Iturrino, T. Liu, D. Goldberg, L. Anderson, H. Evans, A. Fehr, G. Guerin, J. Inwood, J. Lofi, A. Malinverno, S. Morgan, S. Mrozewski, A. Slagle and **T. Williams**. (2013), Performance of the Wireline Heave Compensation System Onboard D/V JOIDES Resolution. Scientific Drilling, No. 15, March 2013, doi:10.2204/iodp.sd.15.08.2013
39. *C.P. Cook, T. van de Flierdt, **T. Williams**, S.R. Hemming, M. Iwai, M. Kobayashi, F.J. Jimenez-Espejo, C. Escutia, J. Jairo González, B.-K. Khim, R.M. McKay, S. Passchier, S.M. Bohaty, C.R. Riesselman, L. Tauxe (et al.) (2013) Dynamic behaviour of the East Antarctic ice sheet during Pliocene warmth. Nature Geoscience 6, 765–769, doi:10.1038/ngeo1889

38. G.S. Wilson, R.H. Levy, T.R. Naish, R.D. Powell, F. Florindo et al. (**T. Williams** and 64 other authors) (2012), Neogene tectonic and climatic evolution of the Western Ross Sea, Antarctica - Chronology of events from the AND-1B drill hole, Global and Planetary Change, 96-97, 189-203.
37. H. Pälike, M. W. Lyle, H. Nishi, I. Raffi, A. Ridgwell et al. (**T. Williams** and 59 other authors) (2012), A Cenozoic record of the equatorial Pacific carbonate compensation depth. Nature, 488, p 609–614, (30 August 2012)
36. L. Tauxe, C. E. Stickley, S. Sugisaki, P. K. Bijl, S. M. Bohaty, H. Brinkhuis, C. Escutia, J. A. Flores, A. J. P. Houben, M. Iwai, F. Jimenez-Espejo, R. McKay, S. Passchier, J. Pross, C. R. Riesselman, U. Rohl, F. Sangiorgi, K. Welsh, A. Klaus, A. Fehr, J. A. P. Bendle, R. Dunbar, J. Gonzalez, T. Hayden, K. Katsuki, M. P. Olney, S. F. Pekar, P. K. Shrivastava, T. van de Flierdt, **T. Williams**, and M. Yamane (2012), Chronostratigraphic framework for the IODP Expedition 318 cores from the Wilkes Land Margin: Constraints for paleoceanographic reconstruction. Paleoceanography, v. 27.
35. **T. Williams**, R. H. Morin, R. D. Jarrard, C. L. Jackolski, S. A. Henrys, F. Niessen, D. Mogens, G. Kuhn, D. Monien, R. D. Powell (2012), Lithostratigraphy from downhole logs in Hole AND-1B, Antarctica. Geosphere, February 2012, v. 8, no. 1, p1-14; doi:10.1130/GES00655.1
34. R. McKay, T. Naish, R. Powell, P. Barrett, R. Scherer, F. Talarico, P. Kyle, D. Monien, G. Kuhn, C. Jackolski, **T. Williams** (2012), Pleistocene variability of Antarctic Ice Sheet extent in the Ross Embayment, Quaternary Science Reviews, doi:10.1016/j.quascirev.2011.12.012
33. *E. L. Pierce, **T. Williams**, T. van de Flierdt, S. R. Hemming, S. L. Goldstein, and S. A. Brachfeld (2011), Characterizing the sediment provenance of East Antarctica's weak underbelly: The Aurora and Wilkes sub-glacial basins. Paleoceanography, 26, PA4217, doi:10.1029/2011PA002127
32. A. Kano, T. G. Ferdelman, **T. Williams** (2010), "Pleistocene Cooling and Challenger Mound, a Deep-water Coral Mound in the NE Atlantic: Synthesis from IODP Expedition 307." Sedimentary Record, v. 8, no. 4, p. 4-9
31. M. Lyle, H. Pälike, H. Nishi, I. Raffi, K. Gamage, et al, including **T. Williams** (2010). The Pacific Equatorial Age Transect, IODP Expeditions 320 and 321; building a 50-million-year-long environmental record of the Equatorial Pacific. Scientific Drilling. 9, p 4-15.
30. R.H. Morin, **T. Williams**, S.S. Henrys, D. Mogens, F. Niessen, D. Hansaraj (2010), "Heat Flow and Hydrologic Characteristics at the AND-1B borehole, ANDRILL McMurdo Ice Shelf Project, Antarctica." Geosphere, v. 6; no. 4; p. 370-378.
29. **T. Williams**, T. van de Flierdt, S.R. Hemming, E. Chung, M. Roy, S.L. Goldstein (2010), "Evidence for iceberg armadas from East Antarctica in the Southern Ocean during the late Miocene and early Pliocene." Earth and Planetary Science Letters, 290, p351-361.
28. T. Naish, R. Powell, R. Levy, G. Wilson, R. Scherer, F. Talarico, L. Krissek, F. Niessen, (47 other authors), **Williams, T.** (2009) "Obliquity-paced Pliocene West Antarctic ice sheet oscillations." Nature, 458, 322-329.
27. S.A. Robinson and **T. Williams** (2008). "Attempts to model the Lower Cretaceous pelagic sedimentary cover of Shatsky Rise (NW Pacific Ocean) from downhole geophysical records." Sedimentary Geology, 212, 1-11.
26. **T. Williams**, T. van de Flierdt, E. Chung, M. Roy, S.R. Hemming, S.L. Goldstein, M. Abrahamowicz, and B. Tremblay (2007), "Insights into the East Antarctic Ice Sheet, 3.5 to 19 Ma, Inferred from Iceberg Provenance." In Antarctica: A Keystone in a Changing World – Online Proceedings of the 10th ISAES, eds. A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007-1017, Extended Abstract 037, 4 p.

25. S.A. Brachfeld, S.R. Hemming, T. van de Flierdt, S.L. Goldstein, M. Roy, **T. Williams**, M. Rosig (2007), "Integrated provenance characteristics of glacial marine sediment from the East Antarctic Margin" In: Online Proceedings of the 10th ISAES, eds. by A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007-1047, Extended Abstract 060, 3 p.
24. F. Niessen, R.H. Morin, **T. Williams**, S. Henrys, T. Crosby, D. Hansaraj, D. Magens, A.C. Gebhardt and the ANDRILL-MIS Science Team (2007), "Comprehensive Downhole and Core Physical-Property Measurements at the AND-1B Drillsite, ANDRILL McMurdo Ice Shelf Project," In: Online Proceedings of the 10th ISAES, edited by A. K. Cooper and C. R. Raymond et al., USGS Open-File Report 2007-1047, Extended Abstract 083, 4 p.
23. A. Kano, T.G. Ferdelman, **T. Williams**, J.-P. Henriot, T. Ishikawa, N. Kawagoe, C. Takashima, Y. Kakizaki, K. Abe, S. Sakai, E.L. Browning, X. Li, and IODP Exp 307 Scientists (2007). "Age constraints on the origin and growth history of a deep-water coral mound in NE Atlantic drilled during IODP Expedition 307." Geology, 35, 1051-1054.
22. **T. Williams**, A. Kano, T. Ferdelman, J.-P. Henriot, and the IODP Expedition 307 scientific party (2006). "Cold-water coral mounds revealed." EOS, 87, issue 47, Nov. 21, 525-526.
21. **T. Williams** (2006), "Magnetostratigraphy from downhole measurements in ODP holes." Physics of the Earth and Planetary Interiors, 156, p261-273.
20. **T. Williams**, D. Handwerger. (2005) "A high-resolution record of Early Miocene Antarctic glacial history from downhole logs, ODP Site 1165." Paleoceanography, 20, PA2017.
19. S. Robinson, **T. Williams**, P. Bown (2004), "Fluctuations in biosiliceous production and the generation of Early Cretaceous Ocean Anoxic Events in the Pacific Ocean (Shatsky Rise, ODP Leg 198)." Paleoceanography, 19, PA4024.
18. T.S. Collett, M.W. Lee, D.S. Goldberg, F.R. Rack, and **T. Williams** (2005). "Nuclear magnetic resonance logging while drilling, ODP Leg 204." Proc. ODP, Sci. Results, 204: College Station, TX (Ocean Drilling Program) 22p.
17. D. Handwerger, A. Cooper, P. O'Brien, **T. Williams**, S. Barr, R. Dunbar, A. Leventer, and R. Jarrard. (2004) "Synthetic seismograms linking ODP sites to seismic profiles, continental rise and shelf of Prydz Bay, Antarctica." Proc. ODP, Sci. Results, 188: College Station, TX (Ocean Drilling Program).
16. G.D. Acton, M. Okada, B. Clement, S. Lund, **T. Williams** (2002), "Paleomagnetic overprints in ocean sediment cores and their relationship to shear deformation caused by piston coring." Journal of Geophysical Research, 107, B4.
15. **T. Williams**, V. Louvel, C. Lauer-Leredde (2002), "Magnetic Polarity Stratigraphy from Downhole Logs, West Antarctic Peninsula, ODP Leg 178." Proc. ODP, Sci. Results, 178: College Station, TX (Ocean Drilling Program).
14. J. Gruetzner, L. Giosan, S.O. Franz, R. Tiedemann, E. Cortijo, W.P. Chaisson, R.D. Flood, S. Hagen, L.D. Keigwin, S.M. Poli, D. Rio, and **T. Williams** (2002) Astronomical age models for Pleistocene drift sediments from the western North Atlantic (ODP sites 1055-1063). Marine Geology, 189, p. 5-23.
13. M. Iwai, G. D. Acton, D. B. Lazarus, L. Osterman, **T. Williams** (2002) "Magnetobiochronologic synthesis of ODP Leg 178 rise sediments from the Pacific sector of the Southern Ocean; sites 1095, 1096, and 1101." Proc. ODP, Sci. Results, 178: College Station, TX (Ocean Drilling Program).
12. **T. Williams**, D. Kroon, S. Spezzaferri (2002), "Middle and Upper Miocene cyclostratigraphy of downhole logs and short to long term astronomical cycles in carbonate production of the Great Bahama Bank." Marine Geology, 185, 75-94.

11. C. Lauer-Leredde, L. Briquieu, and **T. Williams** (2002) "A wavelet analysis of physical properties measured downhole and on core from holes 1095B and 1096C (Antarctic Peninsula). Proc. ODP, Sci. Results, 178: College Station, TX (Ocean Drilling Program).
10. Y. Zhong, B. Clement, G. Acton, S. Lund, M. Okada, **T. Williams** (2001) "Records of the Cobb Mountain Subchron from the Bermuda Rise (ODP Leg 172)." Earth and Planetary Science Letters, 193; 3-4, p. 303-313.
9. S. Lund, G.D. Acton, B. Clement, M. Okada, **T. Williams** (2001) "Paleomagnetic records of Stage 3 excursions." Proc. ODP, Sci. Results, 172: College Station, TX (Ocean Drilling Program).
8. S. Lund, **T. Williams**, G. Acton, B. Clement, M. Okada, (2001) "Brunhes Chron magnetic field excursions recovered from Leg 172 sediments." Proc. ODP, Sci. Results, 172: College Station, TX (Ocean Drilling Program).
7. D. Kroon, **T. Williams**, S. Spezzaferri, T. Sato & J.D. Wright (2000), "Coupled early Pliocene – middle Miocene bio-cyclo-stratigraphy of Site 1006 reveals orbitally induced patterns of Great Bahama Bank carbonate production." Proc. ODP, Sci. Results, 166: College Station, TX (Ocean Drilling Program), 155-166.
6. **T. Williams** & C. Pirmez (1999), "FMS images from carbonates of the Bahama Bank slope, ODP Leg 166: lithological identification and cyclo-stratigraphy." Spec. Pub. Geol. Soc. Lond., 159, 227-238.
5. S. Roger, G. Feraud, J.-L. de Beaulieu, N. Thouveny, C. Coulon, J.-J. Cocheme, V. Andrieu, **T. Williams** (1999) "⁴⁰Ar/³⁹Ar dating on tephra of the Velay maars (France); implications for the late Pleistocene proxy-climatic record.", Earth and Planetary Science Letters, 170; 3, p. 287-299.
4. S.P. Lund, G. Acton, B. Clement, M. Hastedt, M. Okada & **T Williams** (1998), "Geomagnetic excursions occurred often during the last million years." EOS, vol. 79, issue 14, 7 April 1998, p178-179.
3. **T. Williams**, N. Thouveny & K.M.Creer (1998), "A normalised intensity record from Lac du Bouchet: geomagnetic paleointensity for the last 300 kyr?" Earth and Planetary Science Letters 156, 33-46.
2. **T. Williams**, N. Thouveny & K.M. Creer (1996), "Paleoclimatic significance of the 300 kyr mineral magnetic record from the sediments of Lac du Bouchet, France." Quaternary Science Reviews 15, 233-235.
1. N. Thouveny, J-L. de Beaulieu, E. Bonifay, K.M. Creer, J. Guiot, M. Icole, S. Johnsen, J. Jouzel, M. Reille, **T. Williams** & D. Williamson (1994), "Climate variations in Europe over the past 140 kyr deduced from rock magnetism." Nature, 371, p 503-506.

Scientific Fieldwork

- 2015 IODP Expedition 354, Bengal Fan (Jan. 29 to March 31 2015). Member of science party, physical properties and downhole logging.
- 2014 Fieldwork to the Foundation Ice Stream and Recovery Glacier, Antarctica, as part of my NSF project “Deglacial ice dynamics in the Weddell Sea embayment using sediment provenance”. (Nov 2014 to Jan 2015).
- 2014 IODP Expedition 339, South China Sea Tectonics. (late Jan. to March 2014). Logging Scientist.
- 2011 IODP Expedition 339, Mediterranean Outflow Water: its effects on Plio-Pleistocene paleoceanography (Nov. 2011 to Jan. 2012). Logging scientist.
- 2011 Butaritari Island, Kiribati, equatorial Pacific, taking coral minicores for ENSO records from the last 2000 years (August 2011). Field assistant.
- 2010 IODP Expedition 318, Wilkes Land glacial history, East Antarctica: greenhouse to icehouse climate change in the Antarctic, 50-0 Ma. Logging scientist.
- 2009 IODP Expedition 320. Pacific Equatorial Age Transect: greenhouse to icehouse paleoceanographic change, 50-0 Ma. Logging scientist.
- 2006 ANDRILL (ANtartic scientific DRILLing) project on the McMurdo Ice Shelf, Antarctica. Ice sheet history. Position: responsible for the paleoenvironmental and lithological interpretation of the downhole logs.
- 2005 IODP Expedition 307, Cold-water coral mounds west of Ireland: genesis and growth history. Staff Scientist. I organised the shipboard scientists, adapted the drilling plan to conditions at sea, implemented a new frozen core splitting technique, and organised the sample party at the Bremen core repository.
- 2001 ODP Leg 198, Extreme warm climates in the Cretaceous and Paleogene, Shatsky Rise, W. Pacific. Logging scientist.
- 2000 ODP Leg 188, Prydz Bay glacial history, East Antarctica: ice sheet history over the last 35 million years. Logging scientist.
- 1998 ODP Leg 178, Antarctic Peninsula glacial history: ice sheet history over the last 10 million years. Logging scientist.
- 1997 ODP Leg 172, western North Atlantic sediment drifts: glacial-interglacial climate change and geomagnetic field behaviour. Position: logging scientist.
- 1996 ODP Leg 166, western slope of the Bahamas carbonate platform: sea-level and paleoenvironmental change over the last 25 million years. Logging scientist.
- 1990-2 EUROMAARS, Maar lakes of the Massif Central, France: Environmental and geomagnetic change since 400 ka at Lac du Bouchet (1990), Lac St. Front (1991), and Praclaux maar (1992).
- 1990 Gravity survey of NW Skye, Scotland, UK, for Robertson Group plc.

Students and Advising

- Elizabeth Pierce, LDEO (Ph.D. co-advisor). Ph.D. August 2012, Antarctic glacial and geological history).
- Carys Cook, Imperial College London (Ph.D. co-advisor). Ph.D. September 2013, Antarctic glacial and geological history).
- Melissa Hansen, Montclair State Univ. NJ (Ph.D. committee). 2012 onwards.
- Daniel Hauptvogel, Queens College, NY (Ph.D. committee). 2012 onwards. Ph.D. defense Apr. 2015
- Maria Abrahamowicz, McGill Univ., Canada (M.Sc. co-advisor). 2007-2008.
- Mieke Thierens, Cork University, Ireland. (Ph.D. thesis Examiner) Feb 2011. Sediment provenance and cold-water coral mounds.
- Anneleen Foubert, Ghent University, Belgium. (Ph.D. thesis Examiner) May 2007. Cold-water coral mounds.
- LDEO undergraduate summer intern (co-)advisor:
- 2013: Ernesto Martinez. Primary advisor: Alberto Malinverno.
 - 2012: Amanda Duchesne, Daniel Johnson, and Marissa Wright, working on K/Ar dating of Antarctic marine sediments. With Sidney Hemming.
 - 2010: Michelle Mabson and Ethan Dahlhauser. With Sidney Hemming.
 - 2005: Elena Chung, with Tina van de Flierdt and Martin Roy.
 - 2004: Andrew McAuley, with Gisela Winckler.

Outreach

- One week residency on the Instagram account of the International Center of Photography (ICP) @ICPhotog showing photos from Antarctic fieldwork, Jan 2015. Most of the photos yielded more than 250 “likes”. [instagram.com/explore/tags/antarcticag297](https://www.instagram.com/explore/tags/antarcticag297)
- Twitter account @Trevor_on_ice with images and updates from the field in Antarctica (#AntarcticaG297) and IODP Expedition 354 to the Bay of Bengal.
- Wrote a Columbia Earth Institute blog from IODP Expedition 349 to the South China Sea. <http://blogs.ei.columbia.edu/tag/south-china-sea-tectonics/>
- Wrote three series of online stories for Popular Mechanics magazine online about ocean drilling, history of scientific exploration, the relevance of studying past climates to future climate change, ice sheet stability, and sea level rise:
 - ANDRILL project, McMurdo station, Antarctica, e.g. www.popularmechanics.com/science/4204867
 - IODP Expedition 318 to Wilkes Land (Antarctica), e.g. www.popularmechanics.com/science/environment/climate-change/4349415
 - IODP Expedition 320 to the Equatorial Pacific etc. (2006-2010). e.g. www.popularmechanics.com/science/environment/climate-change/4311826
- International Center of Photography - walk-through of the Salgado photography exhibit as part of the Fall 2014 discussion series, ICP Talks: Climate Change. November 7 2014.
- Columbia University host for Columbia alumni on the Corinthian II cruise to the Antarctic Peninsula (Jan 9-22 2007). Lectured on Antarctic glacial history and climate change.
- Presented Scientific Ocean Drilling at the IODP teacher’s event at New Rochelle, NY, April 2013.
- Presented hands-on demos at the Polar Fair at Maryland Science Center, Baltimore, November 2010, the New York Science Fair, June 2011, and judged at NYSEF, March 2012.