# MATTHEW R. LINFORD

# CURRICULUM VITAE

## SUMMARY STATEMENT

***Matthew Linford graduated with a B.S. in chemistry from Brigham Young University in 1990 and received M.S. and Ph.D. degrees from Stanford University in 1996 in materials science and chemistry, respectively. While at Stanford he published the first two papers on monolayers on hydrogen-terminated silicon with his adviser Chris Chidsey. These two papers have been cited more than 600 and 1050 times to date. After a post-doc at the Max Planck Institute in Golm, Germany with Helmut Möhwald studying polyelectrolyte multilayers, Linford worked in industry for three years -- one year with Rohm and Haas (now Dow) and two years with two start-up companies (SEQ, renamed Praelux, and NanoTex). In 2000, he took a position as a faculty member at Brigham Young University and is now a full professor there. While at BYU, Linford has studied new materials for separations science, new materials for long-term digital data storage, and the chemomechanical functionalization of silicon. His work in separations science has led to the launch of the Flare chromatography column that is currently sold by Diamond Analytics. His work in data storage led him to co-found Millenniata, which sells a DVD disc that lasts 1000 years and a Blu-ray disc that will last at least 300. Linford has nearly 250 publications, including about 100 peer-reviewed papers, 25 U.S. patents, 32 conference proceedings, book chapters, peer-reviewed contributions to Surface Science Spectra, commercial application notes, and tutorial articles. His publications have been cited more than 6300 times. He is a contributing editor for Vacuum Technology & Coating (VT&C) where he writes a ca. monthly column on surface and material characterization. He is an editor for Applied Surface Science, an Elsevier journal with a (rising) impact factor of ca. 2.7. Linford is currently serving on the executive committee for the AVS Thin Films Division and has been an associate editor for Surface Science Spectra since 2003. In 2014 he was made a fellow of the American Vacuum Society (AVS). In 2015 he was named an Alcuin Fellow at Brigham Young University. By Google Scholar, he has 6766 citations, his h-index is 33, and his i10-index is 79. As of Feb. 1, 2016, his Research Gate score and impact points were 40.64 and 523.55, respectively.***

## WORK / RESEARCH EXPERIENCE

**Brigham Young University** *Professor, Department of Chemistry and Biochemistry.*
(Provo, UT; 9/12 – present)

- On the cover of Analytical and Bioanalytical Chemistry, Vol. 408, Iss. 4, Feb. 2016.
- Aug. 25, 2015 Was an invited speaker at the 2015 International Symposium on Surface Engineering based Convergence Science & Technology (SECST2015) in Changwon, Korea.

- Aug. 24, 2015 Named as an Alcuin fellow at Brigham Young University for "outstanding teacher-scholars whose work transcends the limits of their disciplines and who have made significant contributions to the general education and honors curriculums."
- July 29, 2015 Spoke as an invited speaker at the 1st International Conference on Applied Surface Science in Shanghai, China.
- July 9, 2015 Became a member of the International Interactions Committee (IIC) of the American Vacuum Society.
- June 8, 2015 Interviewed by BYU Radio (Sirius XM Satellite Radio) See: http://www.byuradio.org/episode/4cf3cf75-5384-40a3-bdb8-923dbe4e710d/top-of-mind-with-julie-rose-fifa-stress-unprison-project-and-female-role-models, the interview starts at ~81:30 minutes
- Named a fellow of the American Vacuum Society Nov. 9, 2014.
- Invited to give a 45 min talk and then lead a 45 min discussion at the Quantitative Surface Analysis meeting (QSA15) in Baltimore, MD on Nov. 9, 2014.
- On July 21, 2014 I was interviewed on 'THE MORNING SHOW' from BYU Radio with Dr. Barry Lunt and Paul Brockbank with regards to our role in creating the M-Disc of Millenniata: http://www.byuradio.org/episode/e087ed2d-3c2b-495f-92e8-92ccc81d46b0/the-morning-show-say-it-nicely-syrian-refugees-cyberlaw
- On July 15, 2014 gave the inaugural 'Imagination Lecture Series' of Corning, Inc. at their R&D center in Sullivan Park, NY.
- Invited speaker at HPTLC 2014 in Lyon, France, 2 – 4 July 2014.
- Work was highlighted on the cover of the Journal of Planar Chromatography in June, 2014.
- Proposal for a half-day symposium on surface and materials analysis at Pittcon 2015 was accepted – per Pittcon rules, will both speak and moderate at this session entitled: "Advanced Surface and Material Analysis by LEIS, XRD, Synchroton Radiation, XPS, and ToF-SIMS, Individually and Combined". Four other world experts in surface analysis will speak as well: Michaeleen Pacholski, Thomas Grehl, Stacey Smith, and Jeff Terry.
- Proposal for a half-day symposium on surface and materials analysis at Pittcon 2014 was accepted – organized and spoke in this symposium entitled: "Advanced Surface and Materials Analysis by XPS, Spectroscopic Ellipsometry, Nano- and ToF-SIMS, RBS, and Helium Ion Microscopy – The Power of These Techniques Individually and Combined". Four other world experts in surface analysis spoke as well: Mark Engelhard, Vaithiyalignam Shuttanandan, Nikolas Podraza, and Zihua Zhu.
- Was regularly one of the most read authors in Surface Science Spectra during 2014.
- Jan. 2014. Millenniata, a company I co-founded, continues to make solid progress in the data storage space. See the recent press release that coincided with the 2014 Consumer Electronics Show in Las Vegas: http://www.prweb.com/releases/2014/01/prweb11469567.htm.
- In Nov. 2013 two of our contributions to Surface Science Spectra were written up and highlighted as 'Editor Picks'.
- The following article, entitled: 'Torture testing the 1,000 year DVD' appeared Nov. 14, 2013: http://www.zdnet.com/torture-testing-the-1000-year-dvd-7000023203/. The author, who is not affiliated with Millenniata, tested various recordable DVDs and concluded that for long-term digital data storage: 'the M-Disc is the only game in town'.
- Elected to serve on the Executive Committee (one of three positions) of the Thin Films Division of AVS for 2014.

- Talk at the AVS 60th International Symposium & Exhibition (Oct. 27 – Nov. 1, **2013**) was selected as a 'hot' topic to be recorded and made available online to conference attendees, members, and to non-attendees on a pay-per-view basis.
- Sept. **2013**. Invited to serve as the external reviewer for Farooq Wahab's Ph.D. defense at the University of Alberta in Edmonton. Gave a seminar during the visit there.
- July 26 – Aug. 10, **2013**. Received half of a Nyrstar Honors Lectureship at the University of Tasmania (UTAS), Hobart, Australia. Taught for six hours at UTAS on XPS, ToF-SIMS, and spectroscopic ellipsometry, and presented a seminar on Aug. 8, 2013 at Nyrstar.
- June 2013. Member of ISO/IEC subcommittee for longevity of physical media (SC21) and TC42 (technical committee 42). This is an international standard that we are helping to establish.
- Millenniata, Inc. (a company I founded), was named a **2013** ComputerWorld Honors Laureate.
- Recipient of Visiting Scholarship at the University of Tasmania (Australia) from Nov. 30 to Dec. 15, 2012.
- Published three articles in LC/GC on elevated temperature chromatography: *LCGC North America* **2012**, *30(9)*, 850 – 862, *LCGC North America* **2012**, *30(11)*, 992 – 998, and *LCGC North America* **2012**, *30(12)*, 1052 – 1057.
- Assistant chair on the organizing committee for the nanoUtah conference in Salt Lake City in **2012**. Served again on the organizing committee in **2013**. This conference draws ca. 200 participants per year.
- On the 2012 Program Committee in both the Electronic Materials & Processing Division and the Thin Film Division for the AVS 159th International Symposium & Exhibition, Oct. 28 – Nov. 2, **2012** in Tampa, FL.
  - My three students and I had four oral presentations at this meeting. All were well attended.
  - I moderated or co-moderated three sessions at this meeting: Session EM+TF-WeM (Hybrid Electronic Materials and Interfaces), Session AS+NS+SS+TF-WeA (3D Imaging & Nanochemical Analysis – Part 2/Advanced Data Analysis and Instrument Control), and Session TF+EM+SS-ThA (Applications of Self-Assembled Monolayers and Layer-by-Layer Assemblies).

**Applied Surface Science (an Elsevier journal)** *Editor.* **(**1/15 – present)

- Journal impact factor ca. 2.7 and rising.
- Oversees the reviewing, revisions, resubmissions, and acceptances of ca. 250 papers per year.

**HealthTell** *Consultant.* **(**Chandler, AZ**;** 12/13 – present)

- Advising company on surface modification and characterization for their protein array product.

**Contributing Editor** *Vacuum Technology & Coating (VT&C).* (1/14 – present)

- Writing a ca. monthly column (ca. 5 – 6 pages) on surface and materials characterization.
- According to the editor, 30,000 print copies of VT&C are sent out monthly, and each issue is read on line 15,000 – 25,000 times.

**Brigham Young University** *Associate Professor, Department of Chemistry and Biochemistry.* (Provo, UT; 9/06 – 8/12)

- Invited speaker at ACS Spring Meeting, **2012**, in San Diego in a session honoring Milton Lee.
- Our work was mentioned in an LC/GC article on Feb. 1, 2012 entitled: 'Connecting with Chromatography at Pittcon 2012' by Marian Nardozzi.
- In **2010**, **2011**, and **2012** my suggestion/application to organize a symposium session at Pittcon was accepted. Spoke as an invited speaker in each of these sessions. The titles of these symposia were:
  - **2010**: 'Emerging Materials in Separation Science'
  - **2011**: 'Advanced Stationary Phases and Supports for Liquid Chromatography'
  - **2012**: 'The Increasing Importance of Temperature in Liquid Chromatography' (one of my graduate students, David Jensen, gave my talk for me in this symposium, although I was an invited speaker in a different symposium in which I spoke – see below.)
- Invited speaker at a Pittcon **2012** symposium organized by Luís A. Colón 'Nanotechnology Meets Liquid Chromatography: Nanomaterials-Based Stationary Phases'.
- Hosted four junior students in my lab during the summer of **2011**: two undergraduates from Southern Utah University, an undergraduate from BYU-I, and a high school student.
- Invited to speak at TTI Vanguard ('The Advanced Technology Conference Series') NEXTGENS TECHNOLOGIES meeting (Dec. 6 – 7, **2011**, Miami, FL). (See http://www.ttivanguard.com/.)
- Our work on thin layer chromatography was written up in LCGC, Vol. 29, No. 5, p. 386, **2011** in an article entitled: "Self-Assembled Nanomaterials for Enhanced Chemical Separations" by Stephanie A. Archer-Artmann and Lisa A. Holland as guest authors for Ronald E. Majors.
- Coauthored a paper in Advanced Functional Materials (*Adv. Func. Mat.* **2011**; *21(6)*, 1132 – 1139) that describes a new method of making microfabricated thin layer chromatography plates. This work contains a statement of attribution, which notes: "M.L. conceived of the TLC application idea".
- Assistant chair on organizing committee for nanoUtah conference in Salt Lake City in **2009**, **2010**, and **2011**. This conference draws ca. 200 participants per year.
- At the International Symposium on Chromatography (ISC **2010**) in Valencia, Spain (Sept., 2010) my graduate student David Jensen gave two oral presentations at different sessions of the conference. Also at ISC **2010**, another of my graduate students, Landon Wiest, gave both oral and poster presentations, and further served in two plenary sessions: once as the chairman and once as the co-chairman.
- My graduate student Landon Wiest was one of the **2010** Award Nominees for the Csaba Horváth Award at HPLC 2010 in Boston, MA.
- Our chromatography work was mentioned in LCGC, Vol. 28, No. 9, p. 774, **2010** in an article entitled: "Highlights of HPLC 2010" by Ronald E. Majors.
- Invited speaker at Microscopy and Microanalysis August, **2010** in Portland, OR.
- Received BYU Technology Transfer Award on Aug. 25, **2009** at the annual BYU university conference.
- Invited (and first) speaker at the Nagasaki Syposium on Nano-Dynamics **2009**, Nagasaki University, Nagasaki, Japan.

- Organized and then presided over a section of the 137th American Chemical Society National Meeting & Exposition, Salt Lake City, UT March 22 – 26, **2009** entitled: "Ultra High Stability Materials for Separations Science".
- Co-presided over a session on at the 137th American Chemical Society National Meeting & Exposition, Salt Lake City, UT March 22 – 26, **2009** on "Nanoscience: Characterization and Applications Tubes, Rods, and Ribbons".
- Work on polymer growth on silicon appeared on the cover of Macromolecular Rapid Communications in **2008**. An undergraduate (Robert Blake) was first author on this paper.
- Named as 'Member of the Editorial Board' (MEB) of the journal: Nanoscience and Nanotechnology Letters (NNL) **2008**.
- Co-PI on a $1,000,000 grant from NSF, **2007**.
- Work on Protein Microarrays appeared in the Journal of the American Chemical Society (**2007**).
- Published two papers in Chemistry of Materials in **2007**: *Chemistry of Materials* **2007**; *19,* 1671 – 1678 and *Chemistry of Materials* **2007**; *19*, 5052-5054.
- Organized a session that took place on June 17, **2007** as part of the ACS Regional Meeting in Park City, UT.

**P2i, Inc.** *Consultant.* (Abingdon, UK; 8/11 – 2/13)

- Signed a research agreement for my lab and a consulting agreement with P2i in August, 2011.

**Xeromax, Inc.** *Founder.* (Provo, UT; 1/2009 – 09/2011)

- In 2009 Xeromax receives "Outstanding Product" award at the Global Moot Corp competition – regarded as the "super bowl of university business plan competitions." at the University of Texas – Austin.
- In 2009 Xeromax receives First Place BYU Business Plan Competition
- In 2009 Xeromax receives Second Place at the Wake Forest Elevator Pitch Competition (national business plan completition)
- Xeromax was mentioned on p. 61 of the Spring 2010 "BYU Magazine" (team members mentioned in the article were: Chris E. Bryant, CEO, Jonathan Ward (COO), Matthew R. Linford, and Gaurav Saini).

**Millenniata, Inc.** *Founder* (American Fork, UT; 7/07 – present)

- Barry Lunt and I cofounded Millenniata (see www.mdisc.com). It has grown from an idea to a real company (headquartered in Utah Valley) with real products (M-Disc DVD and Blu-ray) and real manufacturing (in Taiwan).
- There are many mentions of Millenniata in the press and social media. You might want to Google 'Millenniata'.
- Served on Millenniata's board from its inception in June 2007 until April 2010.
- Millenniata awarded 2011 "Storage Vision" award for technology of the year.
- Millenniata awarded "Most Innovative Product" on Dec. 10, 2009 by the Utah Valley Entrepreneurial Forum.
- Millenniata won the "Best of State" award in the State of Utah in **2009** in "Science & Tech" in the category of "Computer Related Services".

- Millenniata was a finalist at the Utah Innovation Awards on April 30, **2009** in the category of Computer Hardward/Electrical Devices.
- Millenniata won the "Best of State" award in the State of Utah in **2008** in "Science & Tech" in the category of "Computer and Software Providers".
- Millenniata's "Center of Excellence" proposal was funded in **2008** by the State of Utah for $85,000.

**Brigham Young University** *Assistant Professor, Department of Chemistry and Biochemistry.* (Provo, UT; 7/00 – 8/06)

- Work was highlighted on the cover of Synthetic Metals (**2006**; 156 (14-15); 932-937).
- Published review of our work in Accounts of Chemical Research (**2005**; 38(12) 933-942).
- Publications while an assistant professor: 23 peer reviewed papers, 2 conference proceedings, 1 book chapter, 7 peer-reviewed contributions to spectral data bases, and 11 patents.
- Work on silicon surface chemistry was highlighted in a half-page article in Chemical and Engineering News (pg 10, March 21, **2005**).
- Work on silicon surface chemistry was highlighted in a two-page article in Chemical and Engineering News (pgs 34-35, December 1, **2003**).
- Work was highlighted on the cover of Langmuir (February 18, **2003** issue).
- Named as an associate editor to Surface Science Spectra, which is an American Vacuum Society, peer-reviewed journal dedicated to archiving XPS, UPS, and ToF-SIMS data. (January, **2003** – present).

**LaserArray Technologies** *Founder.* (Provo, UT; 2006 – 2011)

- Developing novel laser patterning of surfaces to make bioarrays. (Zhang, Gates, Smentkowski, Natarajan, Gale, Watt, Asplund, Linford Direct Adsorption and Detection of Proteins, Including Ferritin, onto Microlens Array Patterned Bioarrays. *J. Am. Chem. Soc.* **2007**; *129(30)*; 9252-9253.)

**NanoTex, LLC.** *Director of Research.* (Emeryville, CA; 4/99 – 7/00, consultant intermittently between 8/00 and 2/06)

- Developed the "Nano-Dry" product to make nylon and polyester hydrophilic. This product increases the comfort of fabrics and clothing, and is currently being marketed throughout the United States. (Tiger Woods is shown in the October, 2003 issue of Golf Digest wearing a pair of pants that have this finish on them – Nano-Dry had become part of the Nike golf collection.
- Inventor on 10 patents from work with Nano-Tex.
- Designed and synthesized numerous polymers (mostly free radical polymerizations of acrylates and methacrylates).
- Formulated with polymers, surfactants, wetting agents, defoaming agents, *etc*.

**Praelux, Inc.** *Senior Scientist/Consultant.* (Princeton / Lawrenceville, NJ; (11/97 - 2/98, 7/98 - 4/99)

- Developed methods to immobilize single nucleotides and DNA oligomers onto surfaces.
- Developed procedures to attach a nickel (NTA) chelator to glass cover slips to bind proteins with 6-his tags.
- Developed novel methods to immobilize amines onto surfaces.

- Performed surface patterning using microcontact printing.
- Worked on bioconjugation of a protein to glass microspheres.

**Rohm and Haas Co. (now Dow)** *Senior Scientist.* (Bristol, PA; 7/97 - 6/98)

- Developed an IR tool to do rapid screening of catalysts. Designated to write a proposal on using combinatorial and high throughput screening methods to synthesize and characterize catalysts. Wrote a series of macros in Visual Basic for Applications and the Nicolet macro language to automate the rapid screening tool.
- Designed and built a laser scanner for detecting defects on plastic sheet, which was to be used as a substrate for flat panel liquid crystal displays. Wrote an extensive program in Visual Basic that collects the data and drives a two-axis stage.
- Designated to write a report on biosensors and to be part of the team that would bring the latest technologies into the company.
- Analyzed polymers, surfaces, and catalysts using IR microscopy, ATR, and DRIFT. Also familiar with NIR and techniques for IR polymer sample preparation including microtoming, melt pressing, and casting of films.

**Max Planck Institute of Colloids and Interfaces.** *Post Doc.* (Berlin, Germany; 7/96 - 6/97)

- Studied the strong effect of ionic strength on surface dye extraction during dye-polymer multilayer formation. Ultrathin polymer films were characterized by UV-VIS and X-ray reflectivity. (Linford, et al. *J. Am. Chem. Soc.* **1998**, *120(1)*, 178-182.)
- Worked on growing semiconducting particles in polyelectrolyte multilayers. Designed a cell to study the flow-induced orientation of polyelectrolytes on surfaces.
- Described a mixing process using matrix algebra. (Linford and Möhwald, *Anal. Chem.* **1998**, *69(21)*, 4495-4497.)
- Synthesized and characterized films of novel polyelectrolytes. (Schütte et al., *Angew. Chem. Int. Ed.* **1998**, *37(20)*, 2891-2893.)
- Collaborated with Sieval and coworkers on functionalized monolayers on silicon. (Sieval et al., *Langmuir* **1998**, *14(7)*, 1759-1768.)

**Ulvac, Japan.** *Summer Intern.* (Tsukuba, Japan; Summer 1995)

- Created new pyro- and piezoelectric materials using vacuum vapor deposition of monomers followed by poling and curing of the polymer films. (Linford, et al. *Jpn. J. Appl. Phys. Part 1* **1996**, *35*(*2A*), 677-678.)

**Stanford University.** *Doctoral Research.* (Stanford, CA; 1990 - 1996)

- Conceived of and created the first alkyl monolayers on silicon using diacylperoxides (Linford and Chidsey, *J. Am. Chem. Soc. (JACS)* **1993**, *115*, 12631-12632), using 1-alkenes and diacylperoxides (Linford, et al. *J. Am. Chem. Soc.* **1995**, *117*, 3145-3155), and 1-alkenes and light. (Chidsey and Linford *Proceedings of the Fourth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing*, Chicago, Ill., Oct. 8-13, **1995**, 455-461.) These organic monolayers were characterized by XPS, IR, ellipsometry, and wetting.
    - These 1993 and 1995 JACS papers have been cited more than 450 and 850 times, respectively.

- Initiated a collaboration to use synchrotron radiation to characterize monolayers on silicon. (Terry, et al. *Appl. Phys. Lett.* **1997**, *71 (8)*, 1056-1058; Terry, et al. *Nucl. Instrum. Methods Phys. Res., Sect. B* **1997**, *133(1-4)*, 94-101.)
- Conceived of and performed gas-phase free-radical modification of alkyl monolayers. (Linford, (**1996**) Thesis; Wagner, et al. *Journal of Structural Biology*. **1997**, 119 (2), 189-201; Cicero, et al. *Polymer Preprints* **1997**, *38*, 904-905.)
- Made and characterized chlorine-terminated silicon. (Wade, et al. *Mater. Res. Soc. Symp. Proc.* (Electrochemical Synthesis and Modification of Materials) **1997**, 451, 173-183.)
- Conceived of a new method for coating particles. (Linford, Patent filed through Stanford Technology Transfer Office on Feb. 27, **1997**.)
- Collaborated with a scientist at Charles Evans & Associates to do ToF-SIMS of monolayers on gold. (*Langmuir* **1994**, *10*, 883-889.)

**AT&T Bell Labs.** *Summer Intern.* (Murray Hill, NJ; Summer 1992)
- Studied electron transfer across organic monolayers on gold. (Smalley, et al. *J. Phys. Chem.* **1995**, *99*, 13141-13149.)

**Huels, A.G.** *Summer Intern.* (Marl, Germany; Summer 1988)
- Analyzed company products by gas chromatography.

**Brigham Young University.** *Undergraduate Research.* (Provo, UT; 1988 - 1990)
- Researched supercritical fluid chromatography coupled to supersonic jet spectroscopy. (Goates, et al. *Anal. Chem.* **1992**, *64*, 2, 233-238.)

**Missionary for The Church of Jesus Christ of Latter-day Saints.** (Montevideo, Uruguay mission; 1985 - 1987)

## SUMMARY OF EDUCATION

| | |
|---|---|
| Post Doc | Max Planck Institute for Colloid and Surface Science. (7/96 - 6/97) |
| Ph.D. | Stanford University, *Chemistry*. (6/96) |
| MS | Stanford University, *Materials Science.* (6/96) |
| BS | Brigham Young University, *Chemistry* (Magna Cum Laude). (9/90) |

## LANGUAGE SKILLS

- German (*intermediate*), Spanish *(advanced)*
- Has a daily routine of reading the scriptures in other languages – the Old Testament in Yiddish, the New Testament in Latin (loves the Gospel of John), and the Book of Mormon in German, Portuguese, and Italian

## FELLOWSHIPS / AWARDS / HONORS

- Named as an AVS Fellow **2014**
- Millenniata and Xeromax have received multiple awards, some of which are listed above.
- My graduate student Landon Wiest was one of the **2010** Award Nominees for the Csaba Horváth Award at HPLC 2010 in Boston, MA.
- Recipient of BYU Technology Transfer Award on Aug. 25, **2009** at the annual BYU university conference.
- Invited to participate in the Telluride Workshop on Semiconductor Surface Chemistry four consecutive times: 2002, 2006, 2010, and for 2014. This is an invitation only meeting held in the summer in Telluride, CO for 20 – 25 of the world's experts on this subject.
- Invited to spend two weeks during July 2005, one week during May/June 2006, and one week during 2007 at the National Institute of Materials Science in Tsukuba, Japan.
- Recipient of Schlossmann Postdoctoral Fellowship from the Max Planck Society (12/96 - 6/97).
- Recipient of Hertz Fellowship. This is arguably the most prestigious fellowship given to graduate students of science and engineering in the U.S. Also offered but declined NSF and DOD fellowships (1991 - 6/96).
- Ross Tucker Award given by the Electronics Division of the AIME ($2000 prize) (1995).
- Honored Student Award, Brigham Young University (1990).
- Eagle Scout.

# Publications List

### DOCUMENTS SUBMITTED FOR PUBLICATION

1. Supriya S. Kanyal, Tim T. Haebe, Cody V. Cushman, Manan Dhunna, Paul B. Farnsworth, Gertrud Morlock, Matthew R. Linford "Microfabrication, separations, and detection by mass spectrometry on ultrathin-layer chromatography plates prepared via the low-pressure chemical vapor deposition of silicon nitride onto carbon nanotube templates" *Submitted to J. Chrom. A.*
2. Chuan-Hsi Hung, Bhupinder Singh, Michael G. Landowski, Mohammed Ibrahim, Andrew J. Miles, David S. Jensen, Michael A. Vail, Andrew E. Dadson, Stacey J. Smith, Matthew R. Linford "Multi-Instrument Characterization of Poly(Divinylbenzene) Microspheres for Use in Liquid Chromatography: As Received, Air Oxidized, Carbonized, and Acid Treated" *Submitted to Surface and Interface Analysis*.
3. Cody V. Cushman and Matthew R. Linford "Using the Plan View to Teach Basic Crystallography in General Chemistry" *Submitted to Journal of Chemical Education*.
4. Nitesh Madaan and Matthew R. Linford "Metal-Assisted Secondary Ion Mass Spectrometry (MetASIMS) with Bismuth" *Submitted to Surface and Interface Analysis*.

## 2015 Publications

### PEER-REVIEWED PAPERS

5. Nitesh Madaan, Anubhav Diwan and Matthew R. Linford 'Fluorine plasma treatment of bare and nitrilotris(methylene)triphosphonic acid (NP) protected aluminum: an XPS and ToF-SIMS study'. *Surf. Interface Anal.* **2015**, *47*, 56–62. DOI: 10.1002/sia.5666.
6. Supriya Kanyal, Bhupinder Singh, Daniel Jankowski, Matthew R. Linford 'Hydroxylation of the Silica in Microfabricated Thin Layer Chromatography Plates as Probed by Time-of-Flight Secondary Ion Mass Spectrometry and Diffuse Reflectance Infrared Fourier Transform Spectroscopy'. *Accepted Surface and Interface Analysis*.

### PEER-REVIEWED CONTRIBUTIONS TO SPECTRAL DATABASES

7. Supriya Kanyal; David S. Jensen; Zihua Zhu; Matthew R. Linford '$Al_2O_3$ e-Beam Evaporated onto Silicon (100)/$SiO_2$ by ToF-SIMS'. *Accepted Surface Science Spectra.*
8. Supriya Kanyal; David S. Jensen; Zihua Zhu; Matthew R. Linford 'Multiwalled Carbon Nanotube Forest Grown via Chemical Vapor Deposition from Iron Catalyst Nanoparticles by ToF-SIMS'. *Accepted Surface Science Spectra.*
9. Supriya Kanyal; David S. Jensen; Zihua Zhu; Matthew R. Linford 'Silicon (100)/$SiO_2$ by ToF-SIMS'. *Accepted Surface Science Spectra.*
10. Supriya Kanyal; David S. Jensen; Zihua Zhu; Matthew R. Linford 'Thermally Evaporated Iron on an Alumina Barrier Layer by ToF-SIMS'. *Accepted Surface Science Spectra.*
11. Supriya Kanyal; David S. Jensen; Zihua Zhu; Matthew R. Linford 'Thermally Annealed Iron Thin Film on an Alumina Barrier Layer by ToF-SIMS'. *Accepted Surface Science Spectra.*

### ARTICLES IN VT&C MAGAZINE

12. Cody V. Cushman, George H. Major, and Matthew R. Linford 'A Discussion of Terminology Related to Surface Analysis, and of Sample Preparation, Mounting, and Handling for Surface Sensitive Analytical Methods, as Guided by Three ASTM Standards' *Vacuum Technology & Coating, February 2015.*
13. Anubhav Diwan and Matthew R. Linford 'An Introduction to Classical Least Squares (CLS) and Multivariate Curve Resolution (MCR) as Applied to UV-VIS, FTIR, and ToF-SIMS' *Vacuum Technology & Coating, January 2015*.
14. Anubhav Diwan and Matthew R. Linford 'A Brief Introduction to Matrix Algebra' *Vacuum Technology & Coating, January 2015*.

## 2014 Publications

### PEER-REVIEWED PAPERS

15. Bhupinder Singh, Daniel Velázquez, Jeff Terry, and Matthew R. Linford. 'Comparison of The Equivalent Width, the Autocorrelation Width, and the Variance as Figures of Merit for XPS Narrow Scans'. *Journal of Electron Spectroscopy and Related Phenomena* **2014**, *197,* 112 – 117. http://dx.doi.org/10.1016/j.elspec.2014.10.007.

16. Bhupinder Singh, Daniel Velásquez, Jeff Terry, Matthew R. Linford. 'The Equivalent Width as a Figure of Merit for XPS Narrow Scans.' *Journal of Electron Spectroscopy and Related Phenomena*. **2014**, *197*, 56 – 63. http://dx.doi.org/10.1016/j.elspec.2014.06.008.
17. Gupta, V.; Ganegoda, H.; Engelhard, M.H.; Terry, J.; Linford, M.R. 'Assigning Oxidation States to Organic Compounds via Predictions from X-ray Photoelectron Spectroscopy: A Discussion of Approaches and Recommended Improvements.' *J. Chem. Educ.* **2014**, *91(2)*, 232–238. DOI: 10.1021/ed400401c.
18. Hao Wang; Nitesh Madaan; Jacob Bagley; Anubhav Diwan; Yiqun Liu; Robert C. Davis; Barry M. Lunt; Stacey J. Smith; Matthew R. Linford. 'Spectroscopic ellipsometric modeling of a Bi-Te-Se write layer of an optical data storage device as guided by atomic force microscopy, scanning electron microscopy, and X-ray diffraction'. *Thin Solid Films* **2014**, *569*, 124 – 130.
19. Supriya S. Kanyal, David S. Jensen, Andrew E. Dadson, Richard R. Vanfleet, Robert C. Davis, Matthew R. Linford. 'Atomic Layer Deposition of Aluminum-Free Silica onto Patterned Carbon Nanotube Forests in the Preparation of Microfabricated Thin-Layer Chromatography Plates'. *Journal of Planar Chromatography – Modern TLC* **2014**, *27(3)*, 151–156. DOI: 10.1556/JPC.27.2014.3.1.
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