Mass Spectrometry First In Southern Nevada, A Partial Retro and Prospective.

FSCC solves the GC/MS interface problem for all time. Implemented nationally, better data, saves gov't $B's.

A. D. Sauter, and L.D. Betowski, "Quantitative Aspects of GC/MS Analysis," poster session presented at the 28th Annual Meeting of the American Society of Mass Spectrometry, May, 1980.

A.D. Sauter, L.D. Betowski, B.N. Colby, T.R. Smith, and R.G. Beimer, "Fused Silica Capillary Column GC/MS Analysis for Priority Pollutants," Journal of High Resolution Chromatography and Chromatography Communications, August, 1981, 366-384.

Love Canal, Tape Superfund Audits with Multivariate QC Modeled After Athens and J.J. Downs.

W. M. Shackelford, D.M. Cline, L. Faas, G.R. Kurth, and A.D. Sauter, "A Computer Survey of GC/MS Data Acquired in EPA's Priority Pollutant Screening Analysis: System and Results," presented at the Second Chemical Congress of the North American Continent, Las Vegas, NV, August, 1980. *Advances in the Identification and Analysis of Organic Pollutants in Water*, Chapter 33, Ann Arbor Science, 1981.

First LC/MS/MS High Throughput Screening Ever in LV,NV. Major way drugs are discovered last 25 years.

A. D. Sauter, L.D. Betowski, and J.M. Ballard, "Triple Quadrupole Mass Spectrometry, Environmental Applications to PCB's in Industrial Oils, 'Dioxin' Screening and Hazardous Waste Analysis," presented at the 31st Annual Conference of Mass Spectrometry and Allied Topics, May, 1983. The first quantitative MS papers ever written on TSQ in Analytical Chemistry and elsewhere are not shown here.

Dr. Sam Houk, the inventor of ICP/MS funded in LV. The elevator story and his '83 proposal.

Funding of PB/LC/MS, Extrel by Sauter in LV via DC. Later, Waters buys Extrel, enters MS business.

Fundamentals papers on MS from LV and HD, NV.

W.L. Fitch and A.D. Sauter, "Calculation of Relative Electron Impact Total Ionization Cross Sections for Organic Molecules," Anal. Chem. 1983, 55, 832. Paper has > 200 citations over ca. 30 years.

L.D. Betowski, H. Webb, and A.D. Sauter, "The Application of Pulsed Positive Ion Negative Ion Chemical Ionization to the Analysis of Hazardous Wastes," Biomedical Mass Spectrometry, 1983, Vol. 10, No. 6, 369.

A.D. Sauter, W.M. Shackelford, D.M. Cline, L. Faas, and G.R. Kurth, "Applications of a Data Adaptive Background Subtraction Technique for GC/MS Analysis," presented at the Second Chemical Congress of the North American Continent, Las Vegas, NV, August, 1980. *Advances in the Identification and Analysis of Organic Pollutants in Water*, Chapter 35, Ann Arbor Science, 1981.

See nanoLiter.com, newer papers (Below) on induction based fluidics, and video showing 384 channel parallel dispense, nL syringe and much more.

The "Beer's Law Of Mass Spectrometry" published in Analytical Chemistry 1986, embellished in 2010 At ASMS.

A.D. Sauter and J.J. Downs, "Model for the Estimation of Electron Impact GC/MS Response Factors for Quadrupole Mass Spectrometers," presented at the 1985 Pittsburgh Conference, Anal. Chem. 1986, 58, 1665.

A. D. Sauter, W. Fitch, J. Chakel, A. Affel, R. Willoughby and E. Sheenan, "Approaches For Estimating ESI/MS/MS Relative Response," Pittcon 97, New Orleans, LA, March 1997.

A. D. Sauter, R. Willoughby and J. Chakel ,"The Beer's Law Of Mass Spectrometry, Again," ASMS 2010, SLC, Utah. Poster is at nanoliter.xcom.

$1.5 M Data Analysis Project in the 90's with PC's & MS, Other Data At Los Alamos, DOE.

A.D. Sauter, *The Los Alamos Electronic Data Deliverable Ordering And Receiving User's Guide*, Copyright September, 1994. A.D. Sauter, "Microcomputer-Based Environmental Project Management," Environmental Lab, August,

IBF Invented In HD,NVin '98. See many papers below. Solves the LC/MS interface problem for all time?

Sauter,A.D., Grange,G.A., IBF for the 100% Introduction of Samples into Mass Spectrometers and Other Instruments, ASMS poster TP25 at the 59th Annual meeting of ASMS, Denver,CO, June 2011.

Sauter,A.D.,et al, The Introduction of 100% of Liquid Samples into Mass Spectrometers, in preparation.

Patents not referenced. See recent references and video links below to http://www.nanoliter.com/adsauterjr

Recent References, Videos On IBF with MALDI, ESI, DART, SIMS & Other Apps.

1. Tu, T., SauterJr., A.D.; Sauter III, A.D and Gross, M.L., Improving Intensity and Sensitivity of MALDI Signals by Nanoliter Volume Spotting, poster session presented at ASMS 2007, Indianapolis, IN, June 2007. Journal of the American Society of Mass Spectroscopy 2008, 19, 1086-1090

2. Hilker, B.,Clifford, K.J., Sauter Jr., A.D., Sauter 3rd, A.D. and Harmon, J.P. The Measurement of Charge for Induction-Based Fluidic MALDI Dispense Event and Nanoliter Volume Verification in Real Time. J. Amer. Soc. Mass Spectrom. 2009,20:1064-1067.

3. Hilker, B.;Clifford, K. J.; Sauter Jr., A.D.; Sauter III, A.D.; Gauthier, T.; Harmon, J.P. Electric Field Enhanced Sample Preparation for Synthetic Polymer MALDI-TOF Mass Spectrometry via Induction Based Fluidics (IBF). Polymer, Volume 50, Issue 10,8 May 2009, Page 2334

4. Brewer, T. M.,Szakal, C., Gillen, G. Method for improved secondary ion yields in clustersecondary ion mass spectrometry, Rapid Commun. Mass Spectrom,, 2010;24,593-598.

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6. Yergey, A.L.,National Institutes of Health, Bethesda, MD. Personal communication. 2008.

7. Private communication, M. Chu and V. Katta, Genentech Inc.

8. Sauter Jr.,A.D.; Sauter III, A.D, et al, LabAutomation 2010 poster, 384 Channel Parallel NanoLiter/Microliter Non-Contact Induction Based Fluidics with Millisecond Dispensing onto MALDI Platers and into Array Tape., Palm Springs, CA, Feb2010.

9. Cody, R.B.,Dane, J. A., Sauter Jr., A.D.; Sauter III, A.D, ASMS 2010 poster, Sample Preparation and Sample Presentation for Direct Analysis in Real Time (DART), Salt Lake City, UT, June2010.

10. Sauter, A.D., Grange, G.A., IBF For the 100% Introduction of Samples int Mass Spectrometers and Other Instruments., ASMS poster TP25 presented at the 59th Annual meeting of the American Societyof Mass Spectrometry, Denver, CO, June 2011.

11.Sauter, A.D., Shooting 100% of Liquid Smaples, Cells and More Into Mass Spectrometers, MSACL 2012, San Diego, CA, Jan 2012.

12. Sauter, A. D., How Many Chemists does It Take To Place Samples Into A Mass Spectrometer, Pittcon 2012, Orlando, FL.

13. Sauter, A. D., New Sample Preparation, Sample Introduction Approaches for Application Across Analytical Chemistry Using Electric Fields, A Movie Coming To Your Pittcon, Pittcon 2012, Orlando, FL.

14. Sauter, A. D., Shooting 100% of Samples of Nanoliter Volumes Of Liquids, Cells and More Into Mass Spectro., Pittcon 2012, Orlando, FL.

15, 16 ASMS 2012 not given here ask for posters.

Selected IBF Short mostly Old Videos on Youtube.com/adsauterjr

Shooting 100% of ca. 100 nLsinto a JEOL TOF.
http://www.youtube.com/watch?v=skvG1oxdE9o

Shooting ca. 25 nLs in ca.200msec on a robotic platform.
This is a MALDI app, but could do LC/ESI as well.

http://www.youtube.com/watch?v=cv1xWiyDgoM&feature=related

Shooting a viscous liquid up!
http://www.youtube.com/watch?v=VMNdNJHrlEM

Making nanolitersicles thatyou an pick up.
http://www.youtube.com/watch?v=fRmEYyA-270&feature=related

384 channel dispense
http://www.youtube.com/watch?v=jwaK2ntxybg&feature=plcp

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