We don't have anything against mass spectrometry.
We just think it's time for a **worthy alternative.**

VGA-100
GAS CHROMATOGRAPHY DETECTOR

VUV ANALYTICS

Everything you need in one GC detector

VGA-100

Universal and selective detector with sensitive linear response for accurate quantitation
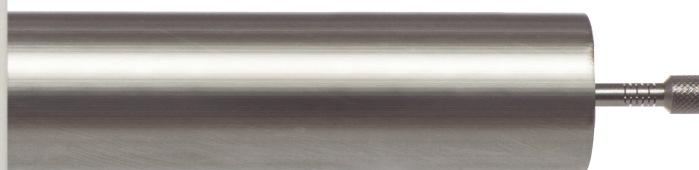
Fast detector response

First-principal technique drastically reduces calibration issues

Easy to operate and maintain, no vacuum pumps required

Unambiguous compound identification and quantitation, including isomers

Excellent temporal resolution

No ionization means minimalsample degradation

Resolve co-eluting analytes and quit worrying about trying to achieve baseline resolved chromatography

"The VUV detector will be used as a universal, calibration-free tool that provides the relative quantitative values of distinct molecules in mixtures in a rapid manner."

Meet the alternative

VGA-100
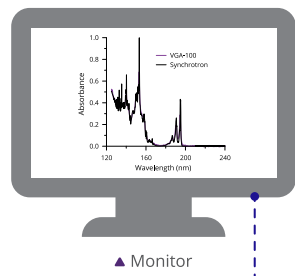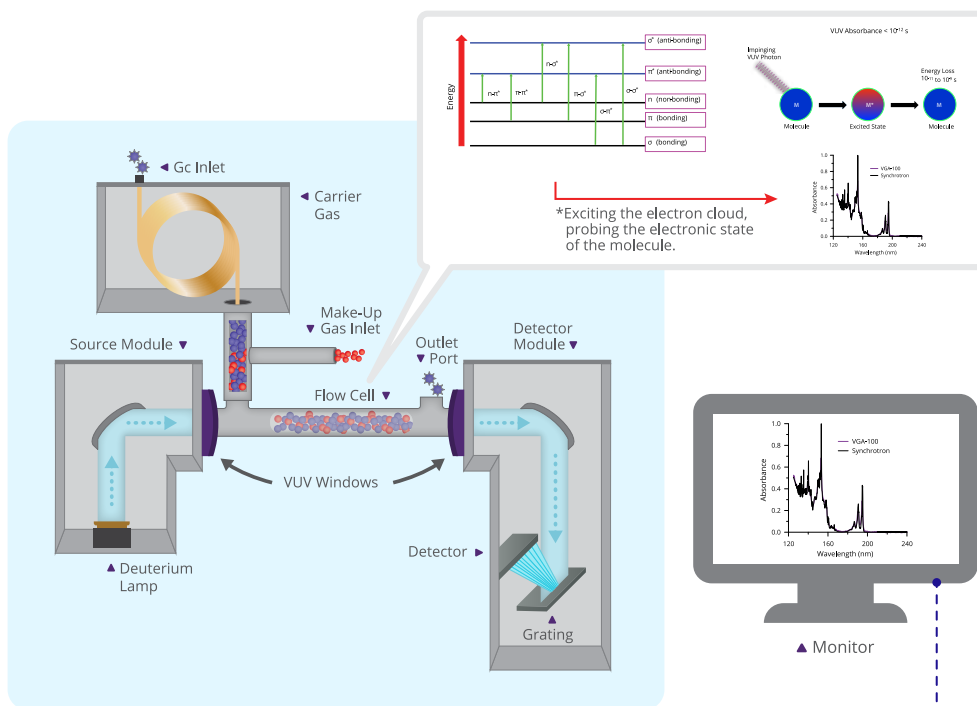
GAS CHROMATOGRAPHY DETECTOR

LUIGI MONDELLO

Chair of ISCC and GCxGC Conference in Riva del Garda and
Professor, University of Messina, Italy

Gas Chromatography detection in a whole new light

All gas phase molecules absorb strongly in the vacuum ultraviolet region, yet application of VUV absorption technology to analytical detection and measurement has not been addressed...until now.

Our patented and proprietary technologies enable the most exciting advancement in GC detection in decades, by making the unique properties of the vacuum ultraviolet region available to the chromatographer for the first time.

The VGA-100 is a universal mass-sensitive gas chromatography detector that provides both qualitative and quantitative data. The strong absorption of gas phase molecules in the VUV provide excellent sensitivity, and the compound-specific absorption spectra provide unparalleled selectivity.

"One thing that I really like about VUV is that it can be considered a universal detector but with the advantage of being familiar to us. We all used UV spectrometers in school."

An analytical solution for every industry

VUV spectra of VOCs: *The VGA-100 resolves product-related isomers and characterizes process impurities.*

Petrochemical
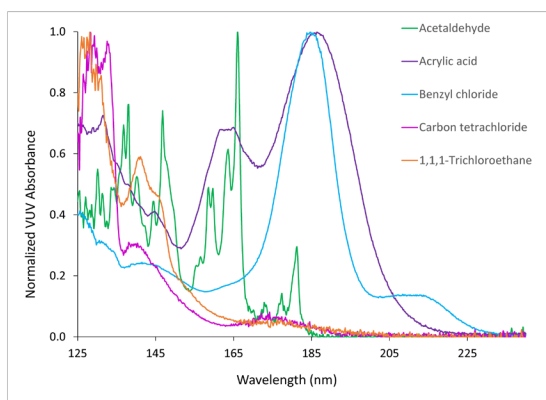
Fatty acid methyl ester VUV spectra: *Process and quality control testing is straightforward using VGA-100 automated analysis.*

Food & Beverage Safety
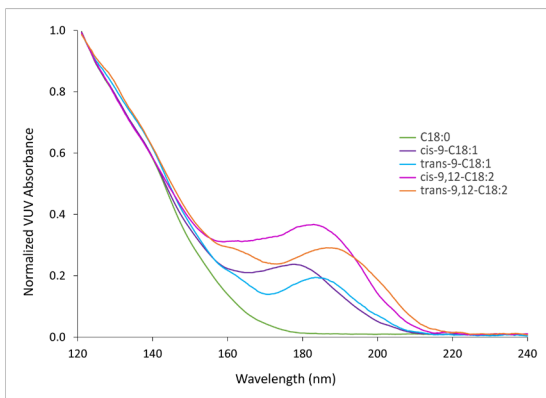
Terpene VUV spectra: *VGA-100 easily differentiates flavor and fragrance isomers while providing their relative concentrations.*

Flavors & Fragrances
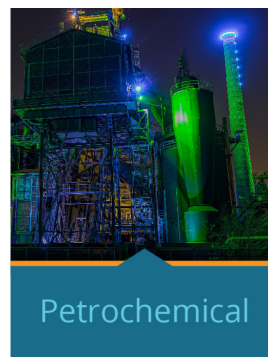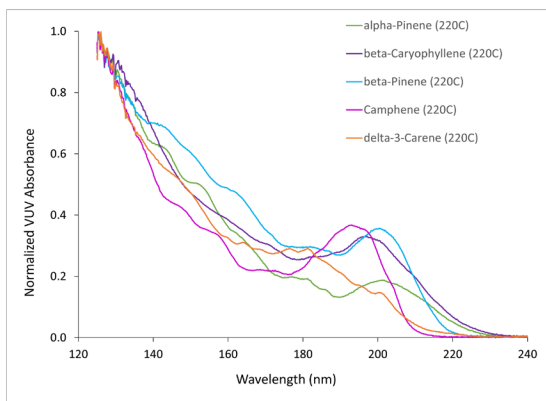
NICHOLAS SNOW

Professor, Seton Hall University, New Jersey, USA

Discover the benefits of VUV

Absorption spectroscopy is a well-understood analytical detection technique offering a wide range of uses. Measured wavelength ranges from the ultraviolet through the infrared are commonly used for gas and solution phase applications.

VUV Analytics has extended the usefulness of the absorption spectroscopy in the vacuum ultraviolet region for the first time ever. A region which was previously limited to synchrotrons, capable of overcoming the environmental challenges.

Most gas phase molecules exhibit strong and unique absorption spectra in the VUV region, including many isomers. The measured spectra can be matched against an existing compound specific absorption cross section library to rapidly identify the compounds. This fitting routine also provides the ability to deconvolve co-eluting peaks, providing a unique orthogonal separation approach.
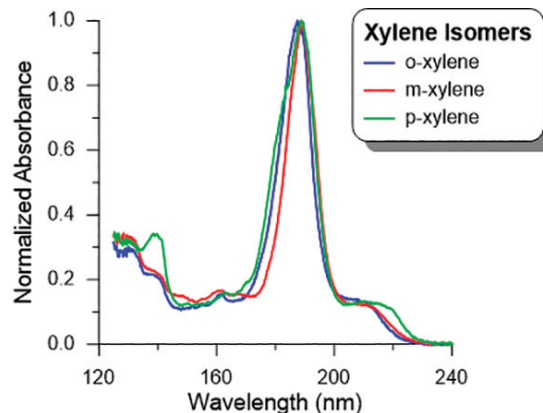
VUV absorbance spectra
*of overlapping xylene isomers*
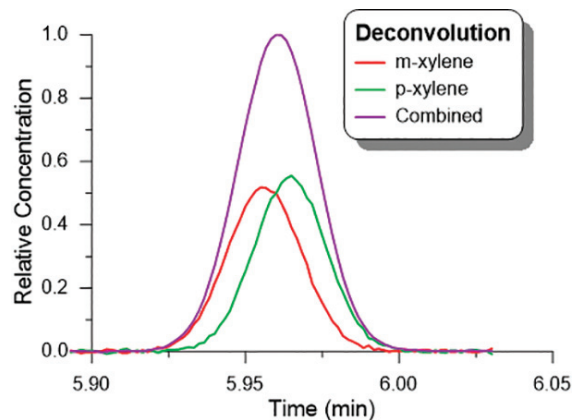
Deconvolution of the overlapping
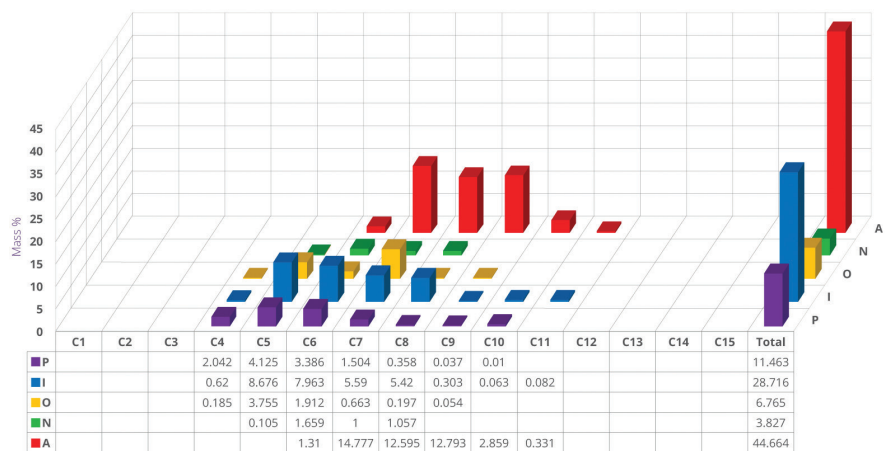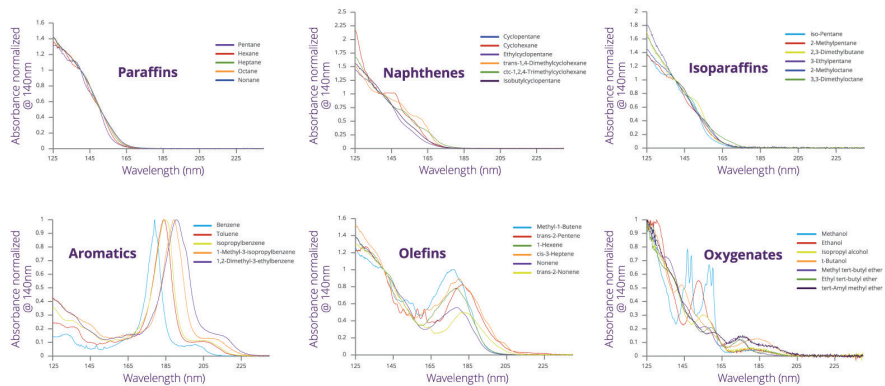*chromatographic signals for*
m- and p-xylene

"VUV spectroscopy adds a dimension that is complementary to mass spectrometry, offering selectivity that is difficult to otherwise obtain."

Fuel analysis simplified

Hydrocarbon mix chromatogram. Inset shows how VUV Analyze identifies peaks by compound class based on their spectral response.
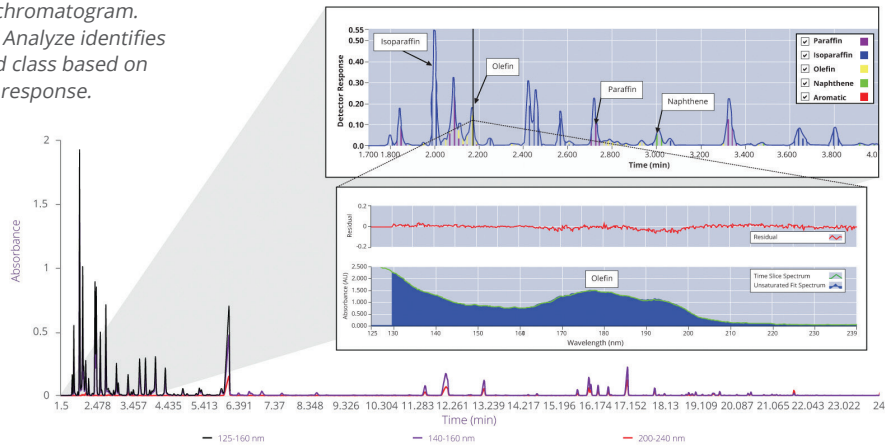
The VGA-100 significantly simplifies PIONA compound analysis in finished gasoline. The VUV absorption spectra demonstrate obvious class similarities, allowing for simplified compound class separation.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	Total
P				2.042	4.125	3.386	1.504	0.358	0.037	0.01						11.463
I				0.62	8.676	7.963	5.59	5.42	0.303	0.063	0.082					28.716
O				0.185	3.755	1.912	0.663	0.197	0.054							6.765
N					0.105	1.659	1	1.057								3.827
A						1.31	14.777	12.595	12.793	2.859	0.331					44.664

HANS-GERD JANSSEN

Professor, University of Amsterdam and
Science leader, Unilever Research Vlaardingen, the Netherlands

Easy to set up,
Easy to use

Intuitive Chromatography Software
Written by Chromatographers for Chromatographers

VUVision software simplifies GC analysis by providing an intuitive interface for analyte characterization by VUV spectroscopy. VUVision delivers straightforward workflows for acquiring and processing data, resulting in high automation confidence and low-risk of analytical error.

VUVision is the base software for system control, data acquisition, library searching, qualitative analysis, calibration, and quantitative analysis by external or internal standard methods. It is intended for both manual post-processing and automated analysis driven by VUV Analyze™. This robust software solution delivers standard chromatographic capabilities and data analysis while providing spectral information that is unique to VUV spectroscopy.
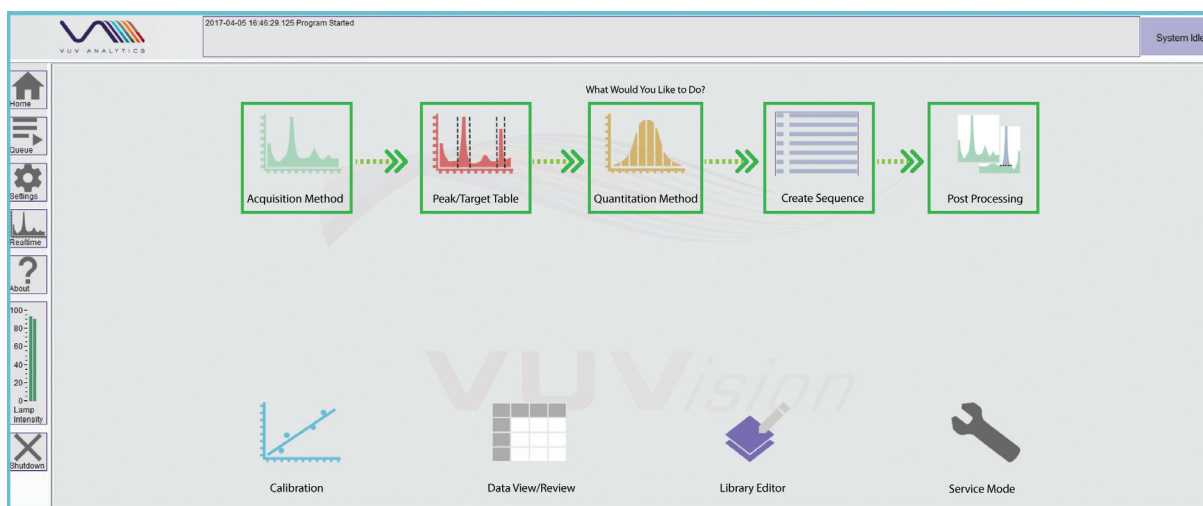
Home Screen workflow: *VUVision provides a straightforward workflow for processing and analyzing data.*

"The VUV detector is a powerful new tool in the GC toolbox."

# Powerful and easy-to-understand analysis tools

Data View / Review

Data View / Review performs qualitative analysis of either currently running acquisitions or previously acquired runs. It is especially useful in analyzing unknown samples using the VUV Auto Qual feature, which provides best fit identification based on VUV library compound matching. Specific peaks or areas of interest can be highlighted for compound identification through VUV spectral library fitting.
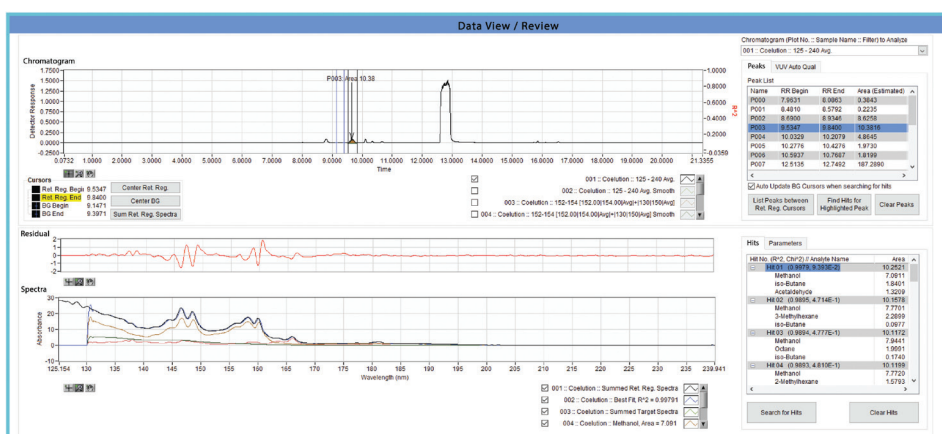
Data View / Review:
Regions of interest can be selected and analyte spectra fit with VUV library compounds.
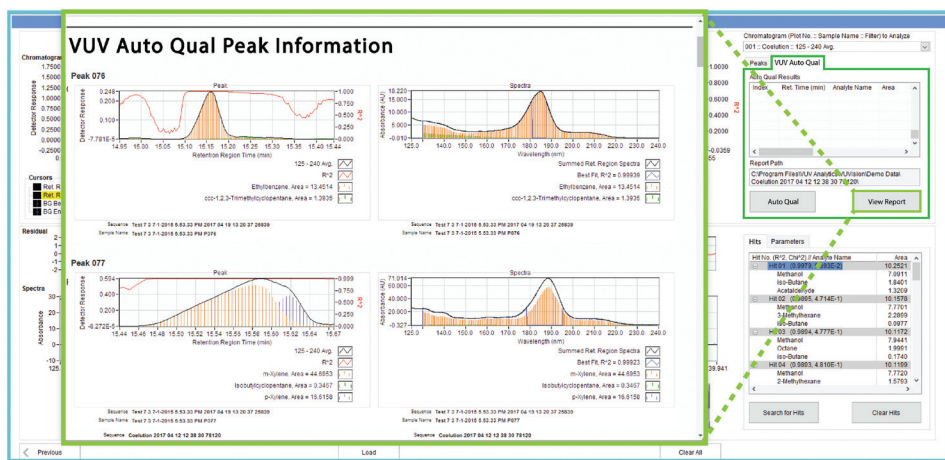
Auto Qual Report:
Auto Qual provides best guess compound identification of unknowns using VUV library compound fitting. A report is generated detailing the chromatographic, spectral, and closest compound match for each peak detected.
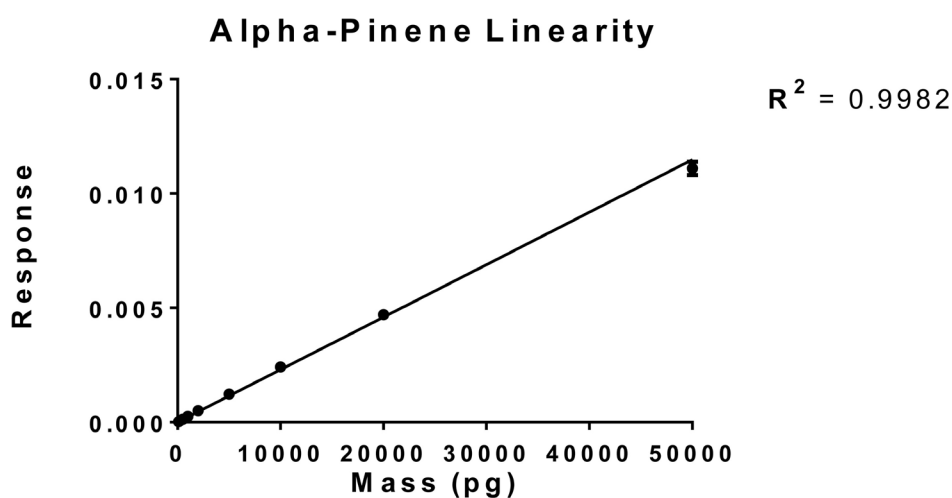
KEVIN SCHUG
Distinguished Professor of Analytical Chemistry,
University of Texas at Arlington

Excellent sensitivity and linearity

The VGA-100 delivers superior performance with low picogram detection limits. The terpene instrument detection limits (IDLs) shown below demonstrated R^2 >0.99 across three orders of magnitude.

TERPENES					
ANALYTE	RETENTION TIME (Minutes)	IDL (pg)	LINEAR DYNAMIC RANGE (pg)	R^2	λ INTEGRATION RANGE (nm)
α-Pinene	3.3	25	20-50000	0.9982	140-160
gamma-Terpinene	4.5	15	20-50000	0.9972	140-160
Geraniol	6.4	25	20-50000	0.9972	140-160
α-Bisabolol	9.9	45	20-50000	0.9957	140-160

Alpha-Pinene Linearity

$R^2 = 0.9982$

(Graph: Response vs Mass (pg), linear plot of data points from 0 to 50000 pg)

"An amazingly simple concept extended into a powerful spectral region."

PARAMETER	VUV ANALYTICS VGA-100	NOTES
Light Source	Deuterium lamp	
Wavelength Range	120 - 240 nm	
Wavelength Accuracy	±0.2 nm	
Wavelength Reproducibility	0.05 nm	
Type of Response	Universal	*H_2, He, Ar are transparent
Spectral Bandwidth	<1 nm	
Maximum Acquisition Rate	>90 Hz	
Data Collection Interval	11 ms	
Response Characteristic	Absorption versus Wavelength	
Measurement Output	Identity, Concentration	
Detected Species	All compounds and classes	*H_2, He, Ar are transparent
Typical IDLs (pg on Column)	alpha-Pinene: 30	
	Methyl Decanoate: 30	
	Fluorene: 35	
	Coumarin: 35	
	n-Decane (C10): 40	
	Phenylacetaldehyde: 40	
	Citronellol: 65	
Linear Range	3-4 orders	
Temperature Range	Ambient - 300° C	
Carrier Gases	H_2, N_2, or He	
Makeup gas	Ar, He, N_2	
Flow Cell Dimensions	10 cm pathlength, <80 μL cell volume	
Instrument Dimensions	30" x 13" x 17", or 76.2 x 33 x 43.2 cm	
Deuterium Lamp Lifetime (hours)	>2000	Lamp intensity half life at 250 nm
Weight	120lbs, or 54.4kg	
Power Input Voltage	100/240V	
Power Consumption	<700 VA	
Operating System	Windows 7 Professional SP1, Windows 8.1	
Additional Facilities Requirements	CDA connection 99.999% N_2 connection, typical 40 mL/min purge requirement	

TIM HOSSAIN, PH.D.

Chief Scientist,
Cerium Laboratories

SCIENCE IN A NEW LIGHT