

Gary R Allen, PhD

Cleveland, OH



APPLIED PHYSICIST, LIGHTING

Developing Innovative Lighting Technology and Products for 33 years
Available for Nationwide, International, or Remote Consulting

LED Lamps and Luminaires - Optics - Thermals - Systems
Spectral Tailoring - Human Centric Lighting, Circadian, Disinfection, Algae cultivation
Legacy lamp technologies: Metal Halide, CMH, LFL, Halogen, Automotive
Patent & Infringement Analysis

Education

Princeton University – Princeton, NJ

PhD in Astrophysical Sciences, Plasma Physics Division, 1980

MS in Astrophysical Sciences, 1977

Pennsylvania State University – State College, PA

MS in Nuclear Engineering, 1975

BS in Nuclear Engineering, 1974

BS in Engineering Science, 1974

Experience

Expert Witness – see Appendix B

Chief Technology Officer, PHYCO2 LLC 2018 to present

Create sustainable commercial algae production while sequestering carbon dioxide (CO₂) emissions as part of carbon capture and utilization operations.

President, Wellness Lighting, LLC 2017 to present

Wellness Lighting's mission is to provide innovative lighting products that are based on recent scientific and medical breakthroughs to improve health and wellbeing, but that are not yet available to the public.

President, Gary Allen Consulting, Inc. 2016 to present

Gary Allen Consulting, Inc. provides consulting and expert witness services related to lighting technology, products, and intellectual property.

- Lighting Technology services include consulting or co-development of innovative technologies to enable your company to create first-to-market, value-added products, applications, and associated intellectual property.
- Lighting Product services include consulting or co-development of new products based on LED, and other SSL sources, for novel lighting applications, especially for the rapidly emerging applications of Spectrally Enhanced, Circadian, Horticultural, Algae, Disinfection, and Bio-active Lighting.
- IP services include Expert Witness for litigation; Prior Art and IP Landscape analysis; Patent and Claim Strategy; IP training for your staff.
 - Expert Witness in one Arbitration case including Trial 2018; one Consulting case 2017
- Available for Nationwide, International, or Remote Consulting

Principal Engineer, Engineering Manager, 1987 to 2016 GE Lighting Cleveland, OH

- 2013 Presented the first ever TED talk on a Lighting Tech topic "A Lighting Revolution"
https://www.youtube.com/watch?reload=9&v=ghwxAIMZF_A
- 2008-2016 Conceived product designs, and led concept development, of several of GE Lighting's flagship LED lamp product lines. Novel optical, thermal, system, and aesthetic breakthroughs resulted in \$10's MM sales, including
 - world's first PAR LED replacement lamp to meet or exceed the performance and aesthetic of Halogen lamps, enabled by a low-glare optic with a smooth beam and beautiful lit appearance (Visual Comfort Lens brand)
 - world's first Energy Star qualified A-line LED replacement lamp (Energy Smart brand), enabled by breakthrough optical and thermal designs, also resulting in the world's first LED replacement lamp to achieve 100 LPW
 - GE's first BR30 LED replacement lamp
 - world's first color-preference-enhanced LED replacement lamps (reveal® brand) A19 and BR30 lamps, and luminaires (reveal® TriGain™ brand), enabled by my co-development of a new state-of-the-art color preference metric, the Lighting Preference Index (LPI)
 - world's first LED display lighting that meets or exceeds all visual and performance attributes of the incumbent Low-watt Ceramic Metal Halide lamps (reveal® Whiter White brand) combining optical brightening for whiter whites with reveal® technology for enhanced colors
 - GE's first lighting to promote circadian health (Align™ & C-sleep brands); primary author of White Paper titled "GE Lighting - Lighting and Sleep"
- 1987-2008 Conceived new technologies and product designs; led concept development; managed programs and teams across every major legacy lamp technology within GE Lighting including Automotive; High Intensity Discharge (MH and CMH); Fluorescent; Halogen Thin Films; Incandescent.
 - As a program manager and team leader, established and led a lamp development team, and a production and sales operation of 7 engineers and technicians from 5/91 to 8/94. In 1996-7, as engineering team leader, led the growth of that engineering and production operation to 20+ people and \$2MM sales.
 - As an applied physicist, developed advanced, innovative new lamp products through the invention, engineering, and production phases, in the areas of metal-halide lamps, halogen lamps, and thin film technology.
 - Provided innovative leadership in the technical training of GE employees, in corporate volunteer activities, and in the recruiting and hiring of new employees.

Research Physicist, 1985 to 1987 Sylvania Lighting Danvers, MA

Independently developed laser-based diagnostics for arc discharge and halogen lamps. These included laser absorption, laser-induced fluorescence, and Rayleigh scattering measurements of gas and plasma parameters. Conceived and initiated the development of several novel concepts for new lamp products.

Member of Technical Staff, 1980 to 1985 Sandia National Labs Albuquerque, NM

Independently developed and implemented several novel, advanced, laser-based diagnostics on terawatt pulsed-power accelerator experiments in the Ion Beam Nuclear Fusion program. These were nanosecond-resolution techniques using Ruby, Nd:YAG, and HeNe lasers.

Ph.D. Research Associate, 1977 to 1980 Princeton University Princeton, NJ

Independently discovered and investigated a new plasma instability in a Q-machine plasma. Published all the essential linear and non-linear, experimental and theoretical properties of the instability as it related to plasma transport in Tokamak nuclear fusion reactors.

Appendix A - Issued U.S. Patents (84 count)

10,422,484	LED lamp with uniform omnidirectional light intensity output
10,381,527	Enhanced color-preference LED light sources using YAG, nitride, and PFS phosphors
10,240,772	Lightweight heat sinks and LED lamps employing same
10,240,087	Enhanced color-preference LED light sources using lag, nitride, and PFS phosphors
10,208,943	Lamps for enhanced optical brightening and color preference
10,197,230	LED lamp with internal mirror
10,196,565	Enhanced color-preference light sources
10,001,256	Structures subjected to thermal energy and thermal management methods therefor
9,981,052	Light disinfection system and method
9,974,138	Multi - channel lamp system and method with mixed spectrum
9,951,938	LED lamp
9,937,274	Light Disinfection System and Method
9,933,308	Method for determining spectrally tuned mixed-color LED light engines
9,680,067	Heavily phosphor loaded LED packages having higher stability
9,676,000	Lighting system w/ reflective coating having cross-linked polymeric powder and a pigment
9,618,165	LED lamp with uniform omnidirectional light intensity output
9,612,002	LED lamp with Nd-glass bulb
9,590,148	Encapsulant modification in heavily phosphor loaded LED packages for improved stability
9,534,743	Directional lamp with beam forming optical system including a lens and collecting reflector
9,416,952	Lighting apparatus with a light source comprising light emitting diodes
9,360,166	LED lamp with uniform omnidirectional light intensity output
9,327,309	Process for reclaiming inorganic powders from polymer-based coating compositions
9,233,510	Lenses for cosine cubed, typical batwing, flat batwing distributions
9,127,816	LED light engine/heat sink assembly
9,103,507	LED lamp with uniform omnidirectional light intensity output
8,864,346	Lens-reflector combination for batwing light distribution
8,864,339	Thermal solution for LED candelabra lamps
8,829,556	Thermal management in large area flexible OLED assembly
8,789,969	Compact LED light engine with reflector cups and highly directional lamps using same
8,757,836	Omnidirectional LED based solid state lamp
8,672,516	Lightweight heat sinks and LED lamps employing same
8,668,356	Lightweight heat sinks and LED lamps employing same
8,613,530	Compact light-mixing LED light engine and white LED lamp with narrow beam and ...
8,608,347	Lighting apparatus with a light source comprising light emitting diodes
8,593,040	LED lamp with surface area enhancing fins
8,541,933	Transparent thermally conductive polymer composites for light source thermal management
8,506,105	Thermal management systems for solid state lighting and other electronic systems
8,415,883	Miniature ceramic metal halide lamp having a thin leg
8,414,151	Light emitting diode (LED) based lamp
8,356,918	Compact beam former for induction HID lamp
8,247,959	Solid state illumination system with improved color quality
8,049,425	Gas-filled shroud to provide cooler arc tube
7,901,110	System and method for forced cooling of lamp
7,800,291	Low wattage fluorescent lamp
7,786,673	Gas-filled shroud to provide cooler arc tube
7,768,207	Highly emissive material, structure made from highly emissive material, and method of ...
7,642,719	Energy efficient fluorescent lamp having an improved starting assembly and preferred ...
7,443,103	High pressure lamp with lamp flicker suppression and lamp voltage control
7,394,200	Ceramic automotive high intensity discharge lamp
7,378,797	Fluorescent lamp with conductive coating
7,352,118	Optimized ultraviolet reflecting multi-layer coating for energy efficient lamps
6,621,219	Thermally insulating lead wire for ceramic metal halide electrodes

6,400,076	Xenon metal halide lamp having improved thermal gradient characteristics for longer ...
5,952,768	Transparent heat conserving coating for metal halide arc tubes
5,896,004	Double ended quartz lamp with end bend control
5,812,713	Optical coupling system with bend
5,774,608	Optical coupling systems with bend
5,676,579	Patterned optical interference coatings for electric lamps
5,675,677	Lamp-to-light guide coupling arrangement for an electrodeless high intensity discharge ...
5,587,626	Patterned optical interference coatings for only a portion of a high intensity lamp envelope
5,569,979	UV absorbing fused quartz and its use for lamp envelopes
5,552,671	UV Radiation-absorbing coatings and their use in lamps
5,526,237	Lighting system for increasing brightness to a light guide
5,420,769	High temperature lamp assembly with improved thermal management properties
5,388,034	Vehicle headlamp comprising a discharge lamp including an inner envelope and a ...
5,387,839	Electrode-inlead assembly for electrical lamps
5,357,167	High pressure discharge lamp with a thermally improved anode
5,283,563	Backlighting of nematic curvilinear aligned phase liquid crystal display panels
5,258,691	Metal halide lamp having improved operation acoustic frequencies
5,253,153	Vehicle headlamp comprising a metal-halide discharge lamp including an inner envelope ...
5,239,230	High brightness discharge light source
5,204,578	Heat sink means for metal halide lamp
5,198,727	Acoustic resonance operation of xenon-metal halide lamps on unidirectional current
5,196,759	High temperature lamps having UV absorbing quartz envelope
5,121,034	Acoustic resonance operation of xenon-metal halide lamps
5,107,165	Initial light output for metal halide lamp
5,047,695	Direct current (DC) acoustic operation of xenon-metal halide lamps using high-frequency ...
5,023,758	Single arc discharge headlamp with light switch for high/low beam operation
4,912,529	Apparatus and method to compensate for refraction of radiation
D732,709	LED lamp with an elevated light unit
D668,362	Lamp
D660,991	Lamp
D658,788	Light emitting diode (LED)-based light bulb
D646,409	Light bulb

Publications

1 invited chapter in a book; 10+ refereed journal articles; 20+ conference papers

Appendix B – Expert Witness Experience

Start - End	Type of Case	Law Firm; Client	Case Name	Services Provided	Disposition
4/1/20 Ongoing	Patent Infringement	Baker Botts LLP; Plaintiff	Autronics Plastics & Clearview v. Apogee & Smalls	Reviewed Infringement Claims	n/a
10/15/19 Ongoing	Class Action Complaint	Pearson, Simon & Warshaw, LLP; Plaintiff	Civil Action No. 4:17-cv-06252-YGR; Young et. al. v. CREE Inc.	Expert Witness Report submitted	n/a
6/24/19 Ongoing	Patent Infringement	Steptoe & Johnson LLP; Defendant	ITC No. 337-TA-1164 (Lighting Science Group v. Leedarson	Retained for Expert Witness Declaration	n/a
6/24/19 9/23/19	Patent Infringement	Steptoe & Johnson LLP; Defendant	ITC No. 337-TA-1163 (Lighting Science Group v. Leedarson	Analysis of Accused Products and Prior Art	Complaint withdrawn in favor of Defendant
1/6/19 2/20/19	Patent Infringement	Hoffman Patent Group; Plaintiff	USPTO Docket No.: 12-10060-CON-REEXAM	Declaration submitted to Patent Office	Pending; key Patent Claims allowed to Plaintiff
5/1/18 8/30/18	Breach of NDA	Terpening, Wilder, Moors PLLC; Plaintiff	TVL International LLC v. Zhejiang Shenghui Lighting Co., Ltd. and Sengled USA, Inc.	2 Expert Reports; 4-day Testimony at AAA Arbitration	Plaintiff Awarded \$3,000,000
1/6/17 3/1/17	Patent Infringement	Wolf & Wolf, LLC; Plaintiff	Aamsco Lighting, Inc. v. Bulbrite Industries, Inc.	Consulting	Settled out of court