



## Book Review

---

# A Gallery of Combustion and Fire

*John Gales\**, Department of Civil Engineering, York University, Toronto, Canada

**Accepted:** 3 August 2021/**Published online:** 6 September 2021

*A Gallery of Combustion and Fire* represents an extensive overview of all aspects relating to the complicated (or not so complicated) nature of fire and combustion. As pointed towards in the first chapter of the book, these processes have the ability to invoke a range of emotions ranging through fear and joy. I would also add inspiration. As an educator foremost, the way fire can be visualized has a profound effect for the uptake of its understanding and the passion to study it further. For the blue whirl (detailed in Chapter 6) specifically which graces the book's cover, I recall how students learning of it the first time remarking of the curiosity of its application and explanation of its behavior (see the below sketch of a 'blue whirl' by Chloe Jeanneret illustrated when introduced several years ago). This led them to have an interest to study fire dynamics and combustion in further detail inspiring them towards a career in fire safety. This book is truly an endeavor and example of STEAM truly bringing art to science and engineering.

This is not what one might think of as a coffee table book—this is so much more—its an educator and student tool. This book is an illustrative collective combustion behavior. Each color image, figure, or sequences of images (there are many) are provided along with a short paragraph description and user-friendly keywords for indexing. Descriptions range in detail but are generally comprehensive enough to follow the theory, provided that the reader has some introductory level of combustion and fire science (I'll speak to this later). Imagery is clear and presented in the highest quality that is possible—I recommend the print version to really take in the imagery. While it must be acknowledged that some photos in the book are older in nature and not the highest quality they are still detailed. The book's back matter is easy to find the image that is sought after making this book very friendly as a learning tool.

Each section of the book points to a subject area within combustion science and there is limited to no omission of subject matter. There are six chapters which complement any curriculum that involves combustion and fire dynamics. The first chapter, *Fundamental Flames*, is more of an introductory chapter to introduce the reader to combustion process with an array of different types and configurations of flames. Chapter 2, *Computational Fluid Dynamics*, follows with a range of imagery for different applied uses from simple burner ignition to large scale fire

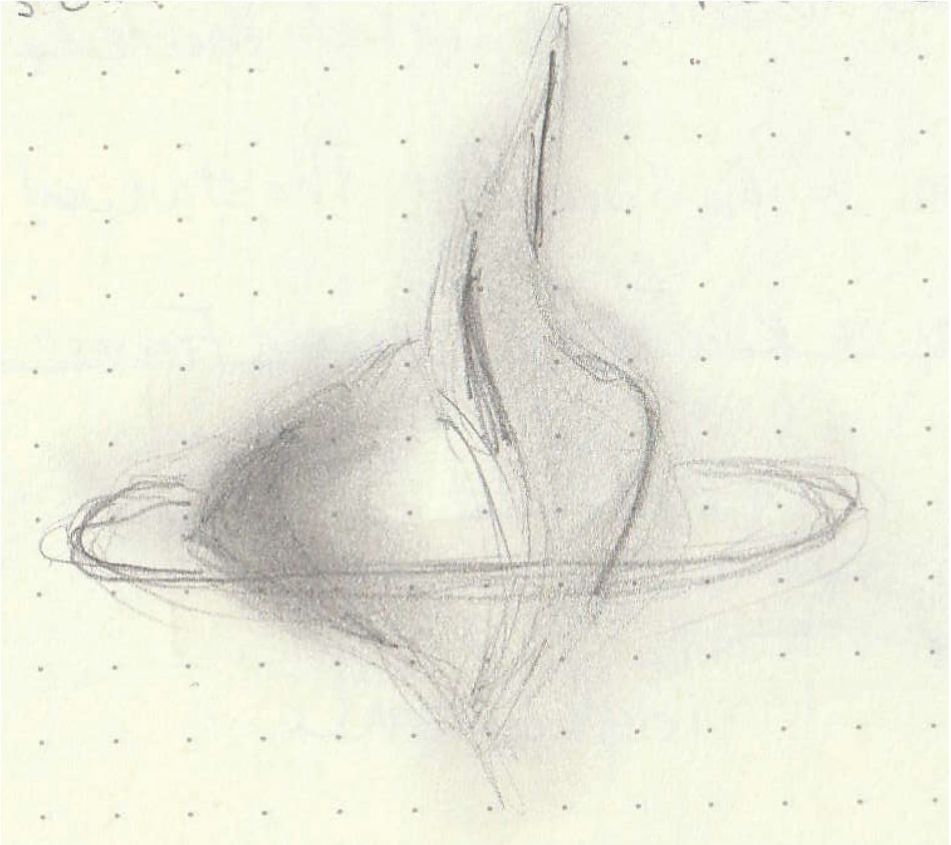
---

\* Correspondence should be addressed to: John Gales, E-mail: [jgales@yorku.ca](mailto:jgales@yorku.ca)



(structural interactions). *Internal Combustion Engines and Gas Turbines* follows in Chapter 3, here a striking illustration of sequential images of gasoline compression ignition shown inside an engine is provided. Chapter 4, *Low Gravity Flames*, really explores the possibilities and challenges in the future of fire research. Chapter 5 considers *Industrial Flames*, where various industry's challenges are being considered. And lastly the book concludes with a broad chapter on *Fires*, for which those having interest in fire dynamics like myself will find most relevant images.

From a critical analysis, I would say the purpose stated and the overall intended audience is a bit muddled in the front matter when you really consider what is being presented by the full authorship team and contributors of this book. It is mentioned that the book does not require previous combustion knowledge. But it is clear that many of the images are accompanied with descriptions which would require completion of a basic first combustion course. Some descriptions though are adequately pitched to the author's intended readership not necessitating a complete background of the theory. But this leads that there is not consistency in the detailing provided for each image presented. I believe this is not a problem, it is more clearly mentioned later that the book that it maintains itself as a companion to more traditional textbooks on the subject so it should be expected that the reader consult other materials to fully describe the theory they are reading. If I were to recommend improvements, I would suggest the authors attempt to feature how paintings can express fire to appeal more broadly. This is becoming increasingly more popular in the fire and combustion research community—for example wildland fires. That though is not necessary for now and an emerging trend. The book already hosts a large amount of graphical expressions and 3D computer generated visualization in this version. I believe a range of audiences will find use to the book and that is achieved clearly upon the full breadth of subject matter explored. From those not familiar, to those who've taken a course, to those currently practicing. And I don't think that this should take anything away from or limit the books value. As an illustrative tool, this is a valuable resource for learning. This book sparks the curiosity within on a seemingly complicated phenomena of fire.



**Sketch of the blue whirl by Chloe Jeanneret of York University's Fire research team (with permission).**