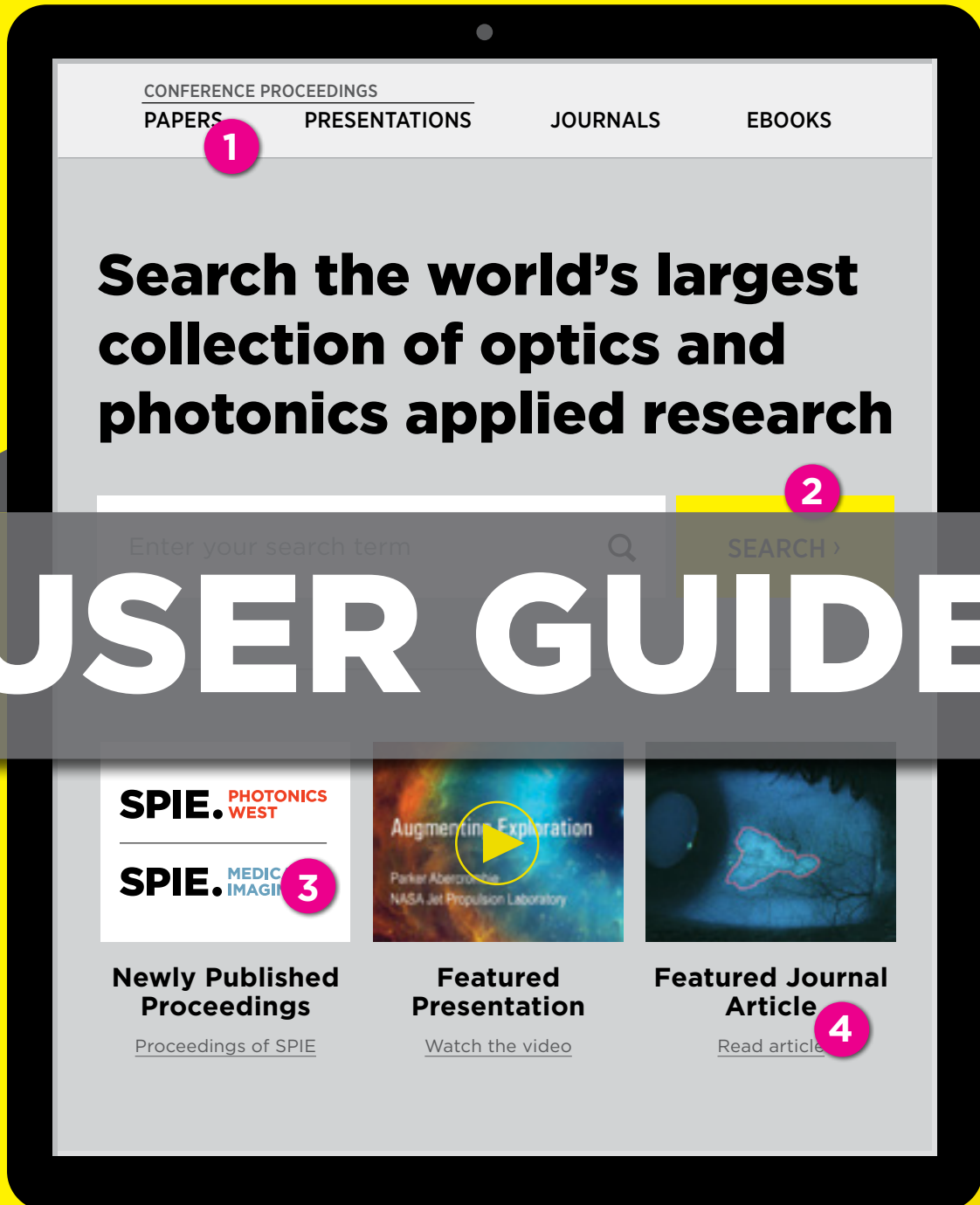


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
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New Features

Improved Design and Navigation: The new site features a refreshed look, enhanced functionality, and improved user experience. Development of additional features and refinements will continue long past the launch.

Presentation Recordings: Presentation recording videos from SPIE conferences are featured on a dedicated landing page and are included as a search filter option. Papers with presentation recordings can be identified by this video icon next to the paper title:  Presentation + Paper

Full text HTML: Proceedings papers dating back to 2014 are displayed in full-text HTML. All SPIE Field Guide and Spotlight eBooks are also displayed in HTML format in addition to the downloadable PDF.

Personalization Tools: Creating a free personal account allows you save citations to a personal library and sign up for new content email alerts. Credentials for personal accounts have been carried forward to the new site, so no need to create a new account if you had one previously.

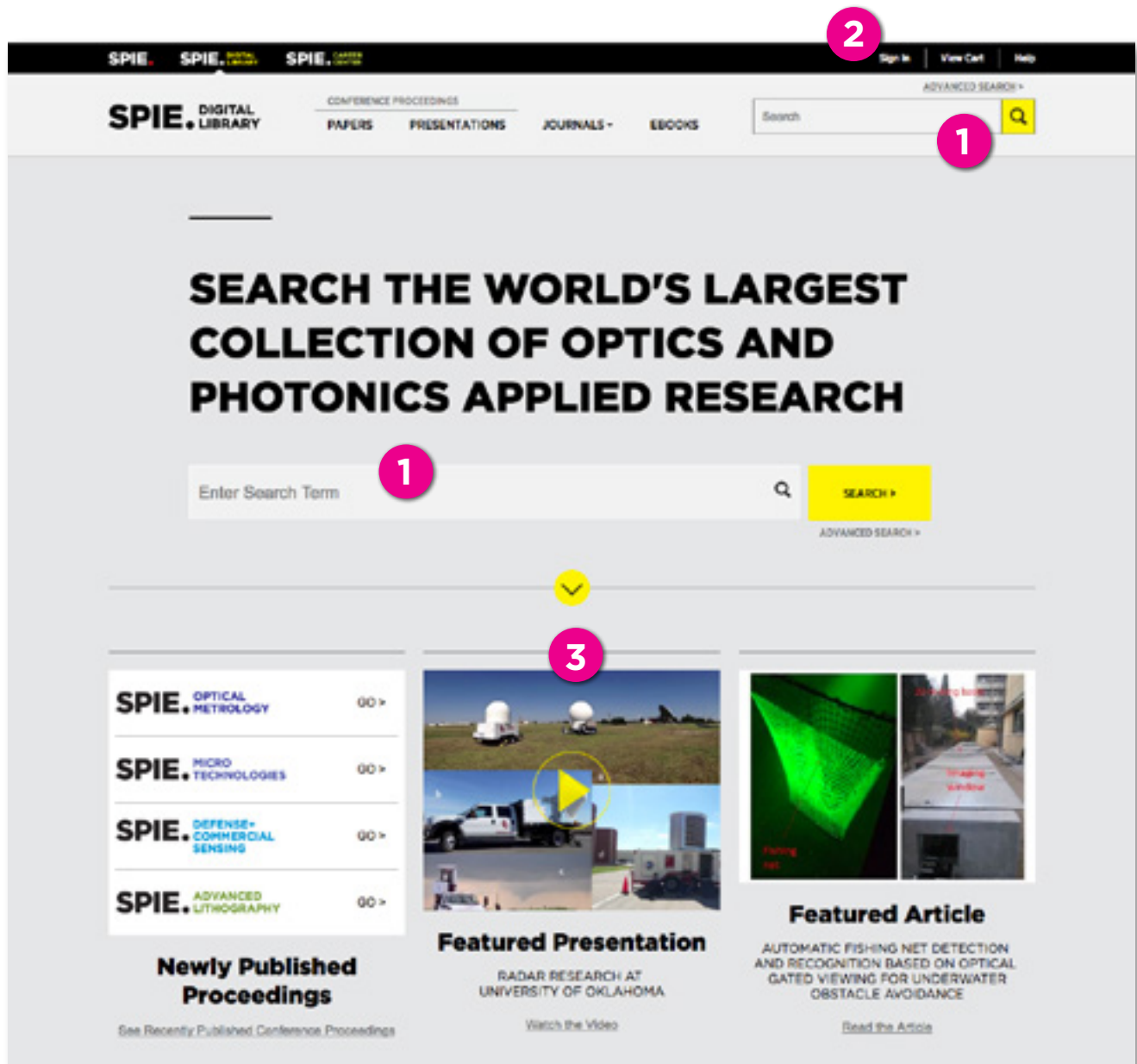
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Expanded Taxonomy: Our taxonomy of 4,000+ terms powers the related content recommendations and improved search to return the most relevant results.

Built In-House: The new SPIE Digital Library was designed and built in-house by our staff, allowing for greater flexibility, responsiveness, and a site that better houses our unique content

Home Page

- 1 Search** – Perform a basic search using the new SPIE Optics & Photonics taxonomy coupled with semantic technology to return relevant results.
- 2 Personal Account Sign-in** – See page 5 for more information.
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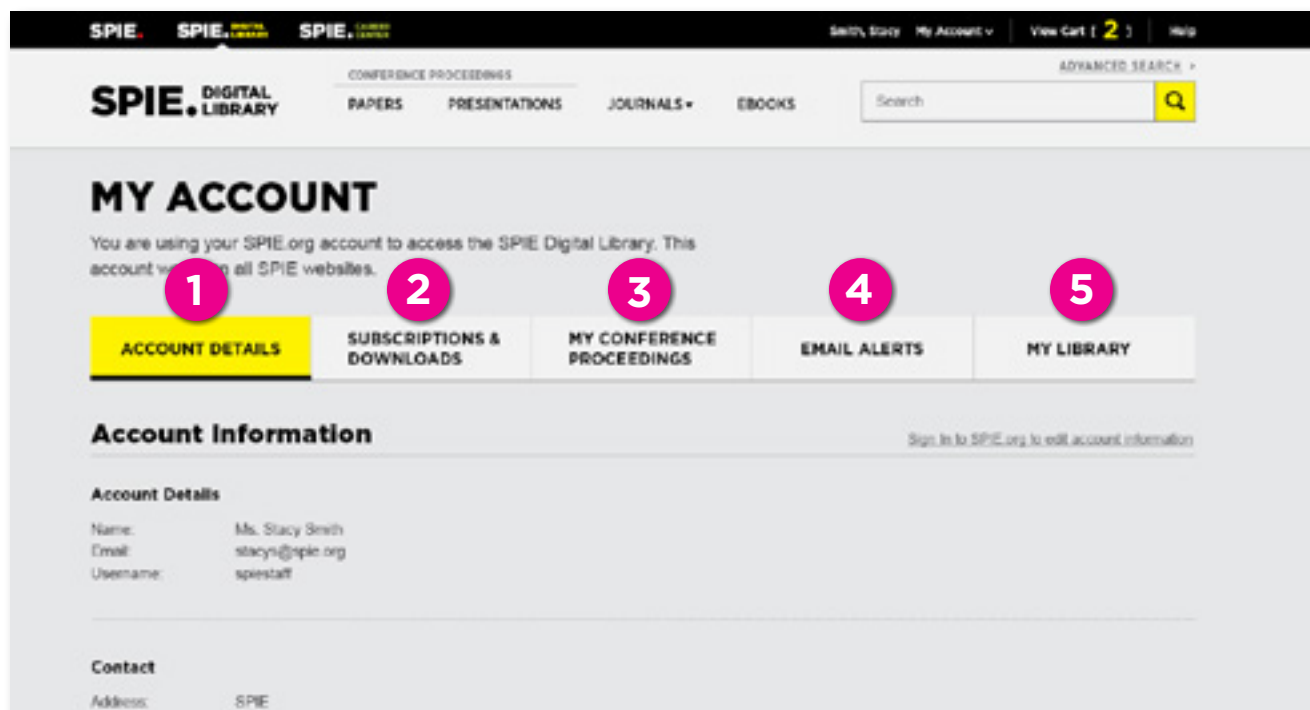


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Advanced Search

Access advanced search by clicking the “Advanced Search” link above the search box on any page.

- 1 Search a combination of keywords, phrases, author names, and publication titles in all fields or limit your search to specific fields.
- 2 Search results can be refined by publication and/or publication date.

The screenshot shows the SPIE Digital Library website with the 'ADVANCED SEARCH' modal open. The modal is divided into three main sections:

- KEYWORDS/PHRASES**: This section contains three input fields for keywords, phrases, author names, or publication titles. Each field has a dropdown menu to select the search scope (e.g., 'All Fields') and a 'Remove' button. A red circle with the number '1' highlights the first input field.
- SEARCH IN:**: This section allows users to refine their search by selecting the type of publication (Proceedings, Journals, eBooks) and the specific volume, issue, or page. A red circle with the number '2' highlights this section.
- PUBLICATION YEARS**: This section includes a range selector (from 1962 to 2017) and a single year selector (YYYY).

At the bottom of the modal, there are 'Clear Form' and 'SEARCH' buttons.

Search Results

The search results page includes powerful new filters to fine-tune the results.

- 1 Search within results and refine your search results.
- 2 Add and remove filters, such as publication type, year, and keywords.
- 3 Sort and display preferences.
- 4 Download PDF or Save to My Library directly from the results page.

The screenshot displays the SPIE Digital Library search results interface. At the top, navigation links for SPIE, SPIE Digital Library, and SPIE Career Center are visible, along with links for Sign In, View Cart, and Help. The main header includes the SPIE Digital Library logo, navigation tabs for Conference Proceedings, Papers, Presentations, Journals, and Ebooks, and an Advanced Search bar. The search results section shows 23 results found for the filters 'lasers' and 'Biochemistry'. On the left, a 'REFINE BY' sidebar contains filters for Publication type (Proceedings/Presentation, Journal Article, eBook), Year (Range, Single Year), and Keywords (Absorption, Luminescence, Spectroscopy, Molecules, Tissues). The main results area lists three articles, each with a title, authors, publication details, keywords, and a 'Read Abstract' link. To the right of each article are buttons for 'DOWNLOAD PDF' and 'SAVE FOR LATER'. Numbered callouts highlight specific features: 1 points to the 'Search within results' input field; 2 points to the '2013-2017' and 'Absorption' filter buttons; 3 points to the 'Sort By: Relevance' and 'Display: 25 per page' controls; and 4 points to the 'DOWNLOAD PDF' button for the second article.

Article Pages

Proceedings and Journal Article pages include:

- 1 New tabs to view the paper in its entirety, jump to a specific section, view only the figures and tables, see supplemental content, find citing articles, or view the references.
- 2 Download a PDF or save the paper for later by adding to My Library, accessed through your personal account.
- 3 Share the paper on popular social media sites or by emailing a link.
- 4 Get citations in popular formats, such as End Note, BibTeX, and others.

The screenshot displays the SPIE Digital Library interface for a journal article. The page layout includes a top navigation bar with SPIE logos and user links (Sign In, View Cart, Help). Below this is a secondary navigation bar with tabs for CONFERENCES, JOURNALS, and EBOOKS. A search bar is located on the right. The main content area features the article title, authors, and a tabbed interface for navigating through the article's sections. On the right side, there is a sidebar with a 'JOURNAL ARTICLE' summary, a 'DOWNLOAD PDF' button, and a list of keywords.

Article Title: Estimating index of refraction for specular reflectors using passive polarimetric hyperspectral radiance measurements

Authors: Jacob A. Martin, Kevin G. Gross

Journal: Optical Engineering, 56(8), 083102 (2017)

Callouts:

- 1: Navigation tabs (ARTICLE, SECTIONS, FIGURES & TABLES, SUPPLEMENTAL CONTENT, CITED BY, REFERENCES)
- 2: DOWNLOAD PDF button
- 3: SHARE button
- 4: GET CITATIONS button

Abstract: Results of a method of estimating index of refraction from passive, polarimetric hyperspectral imaging radiance measurements are presented. As off-nadir viewing hyperspectral imaging platforms gain prominence, estimating index of refraction, which is invariant to viewing angle, may prove advantageous to estimating the emissivity, which is not. Results show that index of refraction can be retrieved to within 8% rms error for fused silica and sapphire glass targets, while simultaneously estimating object temperature. The accuracy and self-consistency of this technique for estimating index of refraction are shown to compare favorably to the maximum smoothness temperature-emissivity separation algorithm. Additionally, the results show that atmospheric downwelling radiance can also be accurately estimated, to within the noise of the instrument, concurrently with index of refraction.

1. Introduction

One of the primary challenges in material classification and ID is dealing with target variability, that is, the same material producing different signatures based on scene conditions, illumination, viewing angle, etc. Target variability is often dealt with using a subspace, which is a group of signatures, to describe the target. As these subspaces become larger, however, it becomes more difficult to distinguish between spectrally similar materials. Most material ID work done in the longwave infrared (LWIR) relies on some form of temperature-

KEYWORDS: Graphene, Resonators, Refractive index, Cavity resonators, Waveguides

Article Pages (cont'd.)

- Graphical representation of keywords in the paper showing relative weighting of terms.
- Related Content – Links to other papers that cover similar subject matter.

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In this study, a wavelength selective structure comprising of two graphene layers, as input and output ports, coupled through a cavity resonator is proposed and analyzed numerically using the finite-difference time-domain (FDTD) method. A midinfrared bandpass filter is achieved, in which the wavelength of the transmission peak is tuned by varying the length of the resonator, the lateral coupling distance between the graphene layers, the dielectric refractive index of the material inside the resonator, and the chemical potential of the graphene layers utilizing appropriate external voltage bias. FDTD simulation results are in good agreement with the theoretical predictions. The simple proposed structures can be easily fabricated to be utilized in compact nanophotonic devices and PICs for optical processors and communication systems in the midinfrared region.

The rest of the paper is organized as follows. In Sec. 2, the theory and simulation methods are introduced. In Sec. 3, the results are presented and discussed. The paper is concluded in Sec. 4.

2. Theory and Simulation Method

The schematic of the proposed basic structure is shown in Fig. 1. Two graphene layers as input and output ports in an antisymmetric configuration are coupled through a cavity resonator. In a practical point of view, the structure should be inserted in a dielectric medium, but for simplicity without limiting the generality, the background index is assumed to be air. The structure is analyzed numerically using the 2-D-FDTD method with a perfectly matched layer absorbing boundary condition around the simulation region. In the simulations, graphene is treated as an ultrathin film. The Kubo formula is used for deriving the surface conductivity (σ_s) of graphene.^{19,20,21} At room temperature and in the midinfrared spectral range, the chemical potential of graphene is always above half of the photon energy. So the intraband transition dominates, and the interband transition is neglected. Therefore, the overall conductivity is simplified as^{21,22}

Figure 1

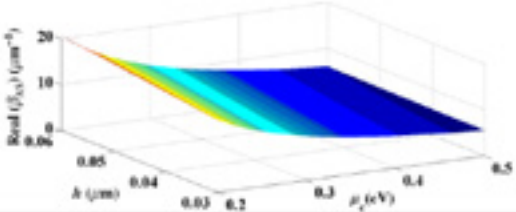


Figure 2

$$\epsilon_{eq} = 2.5 + i \frac{\sigma_s}{\omega \epsilon_0 \Delta}$$

KEYWORDS

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- 1 There is a dedicated Conference Presentation page searchable by year, conference, technology, keyword, etc.
- 2 In addition, the presentation recording is included on an individual proceedings article page if a presentation has been recorded and published.

The screenshot shows the SPIE Digital Library website. At the top, there are navigation links for SPIE, SPIE Digital Library, and SPIE Career Center. Below this, the main navigation bar includes 'CONFERENCE PROCEEDINGS', 'PAPERS', 'PRESENTATIONS' (highlighted in yellow), 'JOURNALS', and 'EBOOKS'. A search bar is located on the right. The main content area features a large heading '1 CONFERENCE PRESENTATIONS' with a subheading 'CONFERENCE PRESENTATIONS'. Below this, a paragraph describes the content: 'Conference Presentations are recordings of oral presentations given SPIE conferences and published as part of the conference proceedings. They include the speaker's narration along with a video recording of the presentation slides and animations. Many conference presentations also include full-text papers. Search and browse our growing collection of more than 8,000 conference presentations, including many plenary and keynote presentations.' To the right of the text is a video thumbnail showing a woman presenting at a conference. Below the text, there is a 'REFINE BY' section with a search bar and a 'YEAR' range selector. To the right of the refine section, there is a 'Plenaries & Keynotes' section with four featured presentations: 'MEMS microphone innovations towards high', 'Smart integrated microsystems: the', 'Research and development program in', and 'Carrier multiplication and charge transport in'. Each presentation has a thumbnail image and a duration timer.

The screenshot shows a video player interface. On the left, there is a video thumbnail with a play button. The video title is 'Diffraction Phase Microscopy using LED'. Below the title, there is a subtitle: 'lower noise due to common-path and non-coherent source'. The video player controls are visible at the bottom. On the right side of the video player, there is a sidebar with a list of categories: 'Image filtering', 'Phase imaging', 'Linear filtering', 'Diffraction', 'Heart', 'Tissues', and 'Microscopy'. Each category has a corresponding horizontal bar.

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The screenshot displays the SPIE Digital Library's EBOOKS section. At the top, there's a navigation bar with the SPIE logo and links for Sign In, View Cart, and Help. Below this, the 'EBOOKS' tab is selected among others like PAPERS, PRESENTATIONS, and JOURNALS. A search bar is located on the right. The main heading 'EBOOKS' is followed by a subtext: 'A growing collection of top optics and photonics titles from SPIE.' Below this, there are two buttons: 'Subscribe to Digital Library' and 'Receive Email Alerts on Newly Released Titles'. A yellow arrow points down to a section titled 'REFINE BY' on the left sidebar. This sidebar lists various technology categories with checkboxes and counts: Optical Design & Engineering (213), Imaging & Signal Processing (183), Sensing & Measurement (135), Biomedical Optics & Medical Imaging (89), Illumination & Displays (57), Semiconductor Devices & Fabrication (58), Defense & Security (42), Lasers & Sources (37), Remote Sensing (30), and Astronomy (24). The main content area shows a grid of eBook covers. The top of this grid includes sorting options ('Sort By: Newest to Oldest') and display settings ('Display: 20 per page'). There are 319 results shown. The eBooks listed include: 'Biofunctionalized Photoelectric Transducers for Sensing and Actuation' by George Knopf and Khalid Al-Arabi; 'Power Harvesting via Smart Materials' by Ashok Datta and Alimulhasan Alimul; 'Optical Gas Sensors for Exhaled Breath Analysis' by Jolko Petruc, Paula Fortes, and Ivo Ramundo; 'Infrared Antennas and Resonant Structures' by Glenn Soreman and Javier Alda; 'Understanding Optical Systems through Theory and Case Studies' by Shun Li and Siqiang Zheng; 'How to Shape Light with Spatial Light Modulators' by Carmelo Rosales-Guzman and Andrew Forbes; 'Computing the Flow of Light: Nonstandard FDTD Methodologies for Photonics Design' by James Cole and Sarveswara Banerjee; and 'Digital Holographic Microscopes: Design, Characterization, and Image Reconstruction' by Vincent Proust.

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