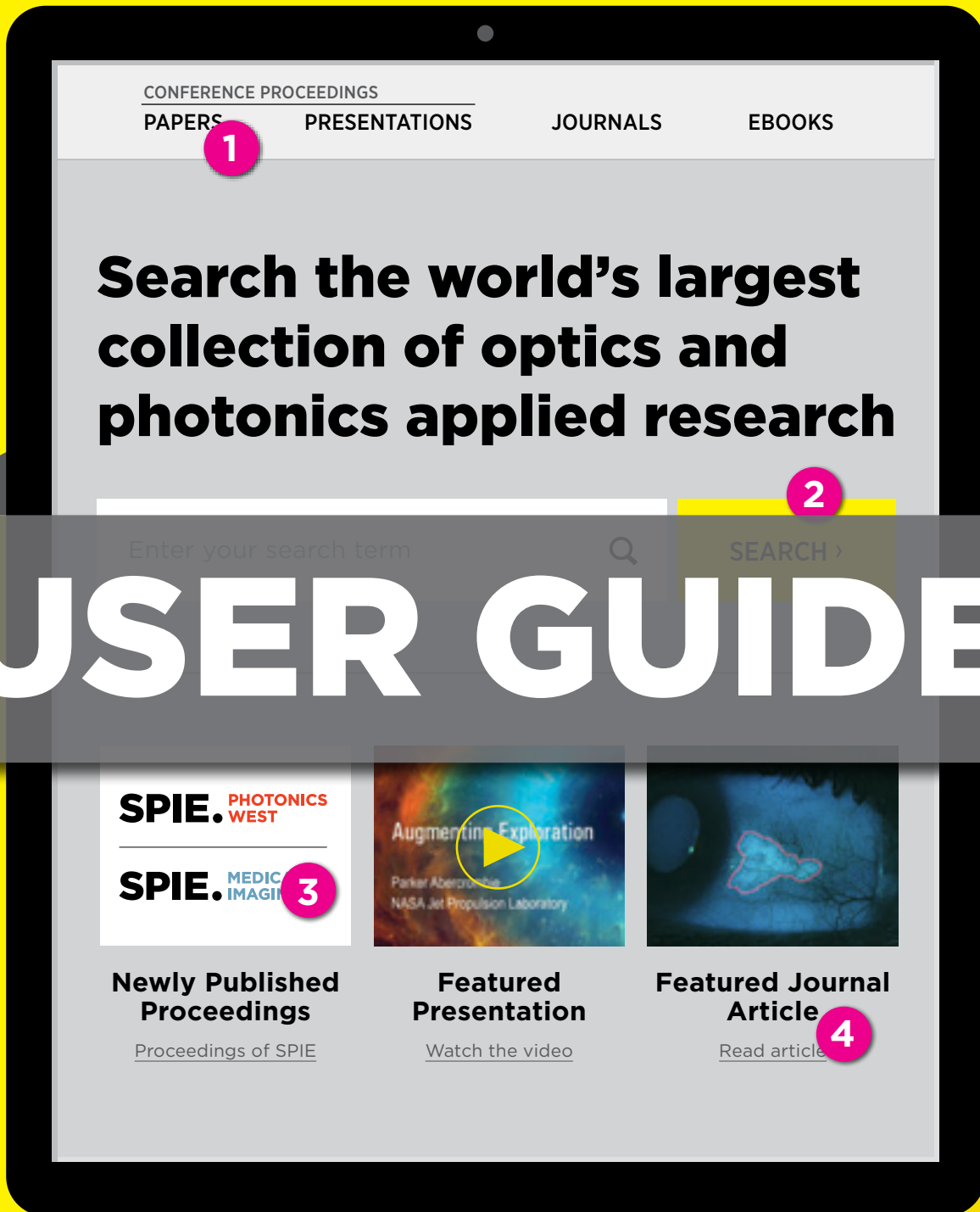


# SPIE. DIGITAL LIBRARY



## USER GUIDE

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# SPIE Digital Library is the world's largest collection of optics and photonics applied research.

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## Proceedings

SPIE is the largest organizer of conferences, workshops, and symposia in the field of optics and photonics with over 300 conferences occurring annually. SPIE Proceedings are the rich outcome of these events, providing you with a snapshot of what is happening—right now.

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30,000+ peer-reviewed journal articles. Coverage back to Volume 1:

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- Neurophotonics*
- Optical Engineering*



## eBooks

310+ SPIE Press eBook titles, featuring:

**Field Guides:** Concise quick-reference guides to key information that students, practicing engineers, and scientists need in the lab and in the field.

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**Press Monographs:** Authoritative reference works, texts, and handbooks.

**Tutorial Texts:** Tutorials covering fundamental and emerging topics at introductory and intermediate levels.



## 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.

**Mobile and Off-Site Access:** The new mobile version of the site has been improved. If you work at a subscribing institution, after creating/logging into your personal account while on your subscribing organization's network, you will be affiliated with the institution's subscription and will have full off-site access.

**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.
- 3 Featured Content** – See the most recently published papers from SPIE Conferences or Journals.

The screenshot shows the SPIE Digital Library Home Page. At the top, there is a navigation bar with the SPIE logo and links for 'Sign In', 'View Cart', and 'Help'. Below this is a secondary navigation bar with 'SPE. DIGITAL LIBRARY' and categories: 'CONFERENCE PROCEEDINGS', 'PAPERS', 'PRESENTATIONS', 'JOURNALS', and 'EBOOKS'. A search bar is located in the top right, with a magnifying glass icon and a '1' callout. The main content area features a large heading: 'SEARCH THE WORLD'S LARGEST COLLECTION OF OPTICS AND PHOTONICS APPLIED RESEARCH'. Below this is a search input field with the placeholder 'Enter Search Term' and a '1' callout. To the right of the input field is a magnifying glass icon and a yellow 'SEARCH >' button. Below the search bar is a '2' callout pointing to the 'Sign In', 'View Cart', and 'Help' links. The page is divided into three main sections. The left section is titled 'Newly Published Proceedings' and lists four categories: 'SPE. OPTICAL METROLOGY', 'SPE. MICRO TECHNOLOGIES', 'SPE. DEFENSE-COMMERCIAL SENSING', and 'SPE. ADVANCED LITHOGRAPHY', each with a 'GO >' button. The middle section is titled 'Featured Presentation' and features a video player with a play button and a '3' callout. The video is titled 'RADAR RESEARCH AT UNIVERSITY OF OKLAHOMA' and has a 'Watch the Video' link below it. The right section is titled 'Featured Article' and features a grid of images related to the article 'AUTOMATIC FISHING NET DETECTION AND RECOGNITION BASED ON OPTICAL GATED VIEWING FOR UNDERWATER OBSTACLE AVOIDANCE'. Below the article title is a 'Read the Article' link.

# My Account

Creating a free personal account allows you to manage your preferences:

- 1 Account Details** – Edit your contact information, update your username and password, and manage your communication preferences.
- 2 Subscriptions & Downloads** – See a list of current and past SPIE Digital Library subscriptions and download token usage.
- 3 My Conference Proceedings** – Links to conference proceedings volumes to which you have access from SPIE conference attendance.
- 4 Email Alerts** – Sign up for email alerts when new journal articles, proceedings volumes, and eBooks are published.
- 5 My Library** – Save citations, add notes, create folders.

**Affiliated Access for Institutional Subscribers:** If your institution subscribes to the SPIE Digital Library, your personal account allows you to log in and gain access to your institution's subscription even when you are away from work or school (for example, from your home computer or mobile phone). To affiliate your personal account with your institution's subscription, simply sign in to your personal account from a computer within your institution's IP range (for example, from a desktop computer at work or school). This will then automatically affiliate your personal account with your institution's subscription.

The screenshot shows the SPIE Digital Library website interface. At the top, there is a navigation bar with the SPIE logo and links for 'SPIE.org', 'SPIE.org', and 'SPIE.org'. Below the navigation bar, the 'MY ACCOUNT' section is highlighted with a yellow background. Five numbered callouts (1-5) are placed over the account management options: 1. ACCOUNT DETAILS, 2. SUBSCRIPTIONS & DOWNLOADS, 3. MY CONFERENCE PROCEEDINGS, 4. EMAIL ALERTS, and 5. MY LIBRARY. Below this, the 'Account Information' section is visible, showing account details for Ms. Stacy Smith.

**Account Information** [Sign in to SPIE.org to edit account information](#)

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Email: stacys@spie.org  
Username: spiestaff

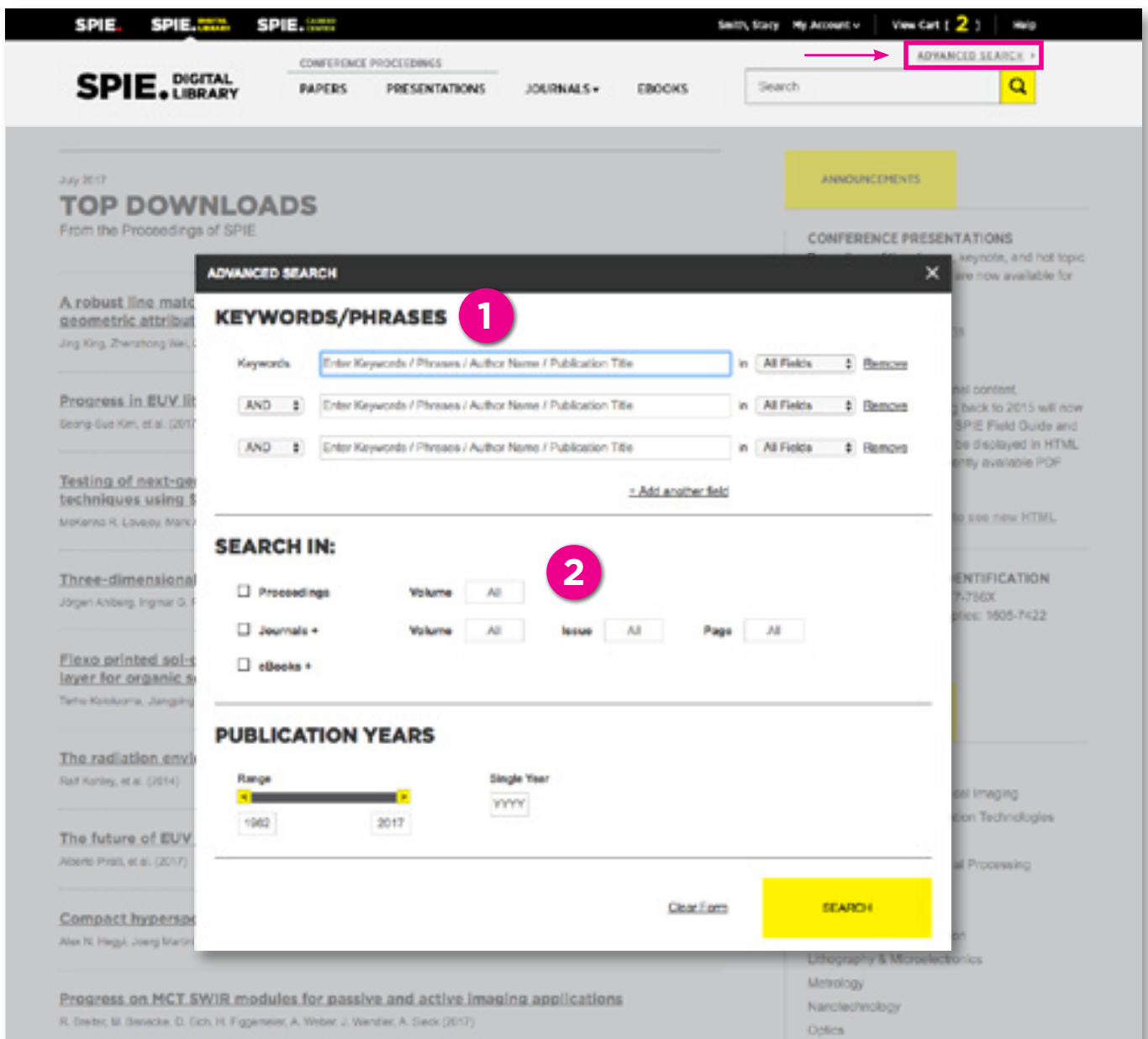
**Contact**

Address: SPIE

# 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.





# 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 shows the SPIE Digital Library search results page. At the top, there is a navigation bar with the SPIE logo and links for 'SPEECH', 'OPTICS', and 'LASERS'. Below this is a search bar with a magnifying glass icon. The main heading is 'SEARCH RESULTS' with '23 results found for: lasers Biochemistry'. On the left side, there is a 'REFINE BY' section with a search box (callout 1) and filters for 'PUBLICATION' (Proceedings/Presentation, Journal Article, eBook), 'YEAR' (Range, Single Year), and 'KEYWORDS' (Absorption, Luminescence, Spectroscopy, Molecules, Tissues). The main results area shows a list of articles with callouts 2, 3, and 4. Callout 2 points to the filter buttons for '2010-2017' and 'Absorption'. Callout 3 points to the 'Sort By Relevance' and 'Display 23 per page' options. Callout 4 points to the 'DOWNLOAD PDF' and 'SAVE FOR LATER' buttons for the first article. The first article is 'Lidar monitoring of organic matter in the Pearl River Estuary' by Feng Chen et al., published in 2014. The second article is 'Lidar monitoring of organic matter in the Pearl River estuary (withdrawal notice)' by Feng Chen et al., published in 2014. The third article is 'Quantum dot optofluidic lasers and their prospects for biochemical sensing' by Alper Koker et al., published in 2016. The fourth article is 'Thermotherapy with a photoacoustic/ultrasound dual-modality agent' by Yu-Hsin Wang et al., published in 2011.

# 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 shows the SPIE Digital Library interface for a journal article. The article title is "Estimating index of refraction for specular reflectors using passive polarimetric hyperspectral radiance measurements" by Jacob A. Martin and Kevin C. Gross. The page includes a navigation bar with "ARTICLE", "SECTIONS", "FIGURES & TABLES", "SUPPLEMENTAL CONTENT", "CITED BY", and "REFERENCES" tabs. A sidebar on the right contains a "JOURNAL ARTICLE 8 PAGES" summary with a "DOWNLOAD PDF" button (callout 2), a "SAVE FOR LATER" button, and social media sharing options like "SHARE" (callout 3) and "GET CITAT" (callout 4). The main content area shows the abstract and the start of the introduction section.



# Article Pages (cont'd.)

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

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SEARCH [ ]

ARTICLE SECTIONS + FIGURES & TABLES SUPPLEMENTAL CONTENT CITED BY REFERENCES Download PDF Save for Later

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 view 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 ( $\sigma_s$ ) of graphene.<sup>23,25,32</sup> 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<sup>31,32</sup>

**Figure 1**

**Figure 2**

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

**KEYWORDS**

- Graphene
- Resonators
- Refractive index
- Cavity resonators
- Waveguides
- Sensors
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# Conference Presentations

Since the start of 2017, the majority of presentations at SPIE Conferences have been recorded. These Conference Presentation recordings capture a presenter's slide and audio presentation, and are available for viewing on the SPIE Digital Library.

- 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 Conference Proceedings. The main navigation bar includes 'PAPERS', 'PRESENTATIONS', 'JOURNALS', and 'EBOOKS'. A search bar is located on the right. Below the navigation, there is a section titled 'CONFERENCE PRESENTATIONS' with a description: '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 this text is a video thumbnail showing a woman presenting at a conference. Below the main content, there is a 'REFINE BY' section with a search bar and a 'YEAR' range selector. To the right, there is a section titled 'Plenaries & Keynotes' with four video thumbnails: 'MEMS microphone innovations towards high', 'Smart integrated microsystems: the', 'Research and development program in', and 'Carrier multiplication and charge transport in'.

The screenshot shows a video player displaying a slide titled 'Diffraction Phase Microscopy using LED'. The slide includes a diagram of the optical setup and a list of technical specifications. The diagram shows an LED source, a collimator, a sample, a microscope objective, a grating, a Fourier mask, tube lens, and a camera. The technical specifications are: 'Common-Path interferometer', '660 nm high power LED source', '3-10 ms exposure time', 'Single shot', and '100-330 fps, depends on FOV'. To the right of the video player, there is a control panel with sliders for 'Image filtering', 'Phase imaging', 'Linear filtering', 'Diffraction', 'Heart', 'Tissues', and 'Microscopy'.

# eBooks

SPIE Press has published more than 320 titles to researchers' desktops on the SPIE Digital Library, including monographs and reference works, field guides, tutorial texts, and the new spotlight series. At least 25 new titles and editions are added to this collection each year.

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