

Curriculum vitae

YOUNGHYUN KIM

Dr. Younghyun Kim is an Associate Professor at Hanyang University ERICA, specializing in optical communications and optical computing. His research spans silicon photonics, electronic–photonic co-integration, and photonic packaging, with a focus on co-packaged optics and photonic interconnects for next-generation AI and data-center applications.

Associate professor, Ph.D.

School of Semiconductor Convergence Engineering, BK21 FOUR ERICA-ACE Center, College of Advanced Technology and Convergence, Hanyang University ERICA

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EDUCATION

The University of Tokyo, Japan, Ph.D., Apr 2012 - Mar 2015 (Japan Government (MEXT) Scholarship Student, 일본문부성장학생)

Dept. of Electrical Engineering, Graduate School of Engineering (GPA : 3.9/4.0)

Thesis: "Study on strain-induced enhancement of plasma dispersion effect and free-carrier absorption for SiGe optical modulators/attenuators"

Advisor: Prof. Mitsuru Takenaka and Prof. Shinichi Takagi

The University of Tokyo, Japan, M.E., Apr 2010 - Mar 2012 (Japan Government (MEXT) Scholarship Student, 일본문부성장학생)

Dept. of Electrical Engineering,

Graduate School of Engineering (GPA : 3.9/4.0)

Thesis: "Research on SiGe based Modulator for Opto-Electronic Integrated Circuit"

Advisor: Prof. Mitsuru Takenaka and Prof. Shinichi Takagi

The University of Tokushima, Japan, B.E., Apr 2007 - Mar 2010 (Korea-Japan Joint Government-Sponsored Overseas Student, 한일공동국비유학생)

Electrical Electronic Engineering,

Faculty and School of Engineering (GPA : 5.0/5.0),

Department Rank 1, First early graduation for 6 semesters in E.E. department

Thesis: "Study on C-V Characteristics of GaN MOSFETs"

Advisor: Prof. Yasuo Ohno and Prof. Jin-Ping Ao

WORK EXPERIENCE

Hanyang University ERICA, Associate professor, Sep 2024 - Present

School of Semiconductor Convergence Engineering, College of Advanced Technology and Convergence
(첨단융합대학, 차세대반도체융합공학부)

Massachusetts Institute of Technology (MIT), Visiting Scientist, Aug 2026 - Present

Research Laboratory of Electronics (RLE)

Hanyang University ERICA, Assistant professor, Sep 2020 - Aug 2024

Department of Photonics and Nanoelectronics

Department of Applied Physics (Joint appointment)

IMEC, R&D Engineer, Jul 2018 - Aug 2020

Si Photonics team, 3D I/O group

Yonsei University, Postdoctoral Researcher, Apr 2017 - May 2018

High Speed Circuit & System Lab., Prof. Woo-young Choi

Alternative military service in South Korea (병역특례, 3-years obligation, Apr 2015 - Apr 2018)

Seoul Semiconductor/Viosys, Senior engineer, Apr 2015 - Mar 2017

Frontier R&D center

Alternative military service in South Korea (병역특례, 3-years obligation, Apr 2015 - Apr 2018)

IMEC, Belgium, Internship, Aug 2014 - Sept 2014

Si photonics team,

Advisor: Dr. Marianna Pantouvaki and Dr. Joris Van Compenhout

Samsung Advanced Institute of Technology, Korea, Internship Jul 2013 - Aug 2013

Graphene transistor team,

Advisor: Dr. Hyun Jae Song and Dr. Seongjun Park

RESEARCH INTERESTS

- **Silicon Photonics and Co-packaged Optics:** Design, fabrication, and characterization of silicon photonic devices — including Mach-Zehnder modulators, ring modulators, grating couplers, and waveguides — toward co-packaged optics and panel-level optical interconnects for next-generation AI and data-center applications. [[Optics Express 2025](#)] [[Optics Letters 2026](#)] [[Photonics Research 2022](#)]
- **Oxide Semiconductor and its Memory Applications:** Exploration of amorphous oxide semiconductor (AOS) thin-film transistors (TFTs) — including a-IGZO and a-ITZO — for ferroelectric memory (FeFET, FeDRAM) and neuromorphic display applications. [[Nanoscale 2024](#)] [[ACS AEM 2025](#)] [[IEEE TED 2024](#)]

RESEARCH GRANTS

Ongoing (수행중)

2026 lab-allocated funding: approx. KRW 1.79 billion across 9 projects as Project Leader (2026년 연구실 배정 연구비 약 18억 원, 당해 협약금액 기준)

- Development of a High-Reliability Integrated Design/Verification Platform for 200 Gb/s/λ Tx-Rx Highly-Integrated Co-Packaged Optics and Ultra-Fine Interconnects**
 (200 Gb/s/λ급 Tx-Rx 고집적 Co-Packaged Optics·초미세 인터커넥트 고신뢰 통합 설계·검증 플랫폼 구축)
 Korea Institute for Advancement of Technology (KIAT, 한국산업기술기획평가원), Public-Private Joint Investment Semiconductor Advanced Workforce Program (민관공동투자반도체고급인력양성)
 Project Leader (Sub-project) · Apr 2026 – Dec 2030 · 2026: KRW 107.47M incl. private matching fund (약 1.07억 원, 민간 대응자금 포함)
- Opto-Chiplet-Integrated Interposer Technology for 2.5D Optical-Packaging-Based CPO**
 (2.5D 광패키징 기반 CPO를 위한 Opto-chiplet이 집적된 인터포저 기술)
 National Research Foundation of Korea (NRF, 한국연구재단), Future-Promising Original Technology Development Program — Next-Generation Photonic Packaging Technology (미래유망원천기술개발사업 (차세대광패키징기술개발))
 Project Leader (Sub-project) · Jun 2025 – Dec 2029 · 2026: KRW 717.96M (약 7.18억 원)
- Development of a Multi-Channel Optical Interconnect Module Chip with Integrated Optical Modulators**
 (광 변조기 집적 다채널 광 배선 모듈 칩 개발)
 Korea Technology and Information Promotion Agency for SMEs (TIPA, 중소기업기술정보진흥원), Startup Growth Technology Development Program — TIPS (창업성장기술개발사업(TIPS))
 Project Leader (Sub-project) · Jul 2024 – Dec 2026 · 2025–2026 phase: KRW 31.49M (약 0.31억 원)
- Research on Resonator-Based Silicon Photonic Optical Modulators for Ultra-High-Speed/Low-Latency Tbps-Class Optical I/O**
 (초고속/저지연 Tbps급 Optical I/O용 공진기 기반 실리콘 포토닉스 광변조기 연구)
 National Research Foundation of Korea (NRF, 한국연구재단), Basic Science Research Program — Excellent New Researcher (이공분야기초연구사업(우수연구-신진연구))
 Project Leader (Individual) · Apr 2024 – Mar 2027 · 2026: KRW 258.22M (약 2.58억 원)
- Development of a Massively Parallel Free-Space Optical Processor for High-Speed Optical Neural Network Computation**
 (광학 인공지능경망 고속 연산 구현을 위한 대규모 병렬연산 자유공간 광학 프로세서 개발)
 National Research Foundation of Korea (NRF, 한국연구재단), Next-Generation Photonics-Based Computing Semiconductor Core Technology Development Program (차세대광기반연산반도체핵심기술개발사업)
 Project Leader (Sub-project) · Jul 2026 – Dec 2030 · 2026: KRW 184.98M (약 1.85억 원)
- Development of Low-Loss Optical Interconnect Technology for Future Semiconductors with Optical Packaging**
 (광패키지 탑재 미래 반도체용 저손실 광배선 기술 개발)
 Samsung Electronics — Future Technology Industry-Academia Program (삼성전자(미래기술산학))
 Project Leader (Overall) · Nov 2023 – Oct 2026 · 2025–2026: KRW 150.00M (1.50억 원)

- **High-Power Laser Study on Optical Adhesives for Silicon Photonics Applications**
Henkel Korea Co., Ltd., Seoul Branch (헨켈코리아(유) 서울지점) — Industry-Academia Collaboration Research (산학협력연구)
Project Leader (Overall) · Sep 2026 – May 2027 · KRW 62.00M (0.62억 원)
- **2026 Regional Key-Industry University–Industry Linked OpenLab Program**
(*(오픈랩2) 2026 지역 중점산업 기반 대학기업 연계형 OpenLab 육성지원 사업*)
Gyeonggi Provincial Government (경기도청)
Project Leader · Jan 2026 – Dec 2026 · KRW 244.98M (약 2.45억 원)
- **Micro-Transfer-Printing-Based High-Efficiency Light Sources for Glass-Substrate Photonic Circuits for Quantum Communication**
(*양자 통신용 유리 기판 광회로 구현을 위한 마이크로 전사 프린팅 기반 고효율 광원 원천기술 개발*)
Korea Advanced Nano Fab Center (KANC, 한국나노기술원), Gangwon Province Contract Research (강원도 연구용역사업)
Project Leader · May 2026 – Nov 2026 · KRW 33.00M (0.33억 원)

Completed (수행완료)

- **Development of a Commercial-Grade 400 Gbps QSFP-DD Optical Transceiver Based on Silicon Photonics with Chip-on-Board Packaging Technology**
(*칩온보드 기술이 적용된 상용화 수준의 실리콘 포토닉스 기반 400Gbps QSFP-DD 광트랜시버 개발*)
Institute for Information & Communications Technology Planning & Evaluation (IITP, 정보통신기획평가원)
Project Leader (Sub-project) · Apr 2023 – Dec 2026
- **Thermal Analysis and Performance-Enhancing Structure Research on Micro Opto-/Electronic Devices for Next-Generation Displays**
(*차세대 디스플레이용 마이크로 광/전자소자 열분석 및 성능 향상 구조 연구*)
Korea Basic Science Institute (KBSI, 한국기초과학지원연구원)
Project Leader (Overall) · Apr 2023 – Feb 2026
- **Simulation and Design of SiN-Photonics-Based Optical Devices**
(*SiN 포토닉스 기반 광소자 시뮬레이션 및 설계*)
Electronics and Telecommunications Research Institute (ETRI, 한국전자통신연구원) — Contract Research
Project Leader · Feb 2024 – Jul 2024
- **Development of Manufacturing Technology for 150 W-Class Laser Diode Arrays for Material Processing**
(*150W급 가공용 레이저 다이오드 array 제조기술 개발*)
Korea Institute for Advancement of Technology (KIAT, 한국산업기술기획평가원)
Co-Investigator · Apr 2021 – Dec 2024
- **Development of III-V Optical Phase Shifter Technology Based on Heterogeneously Integrated Silicon Photonics**
(*이종집적 실리콘 집적광학 기반 III-V 광위상이동기 기술 개발*)
National Research Foundation of Korea (NRF, 한국연구재단) — International Joint Research with IMEC

(IMEC 국제공동연구)

Project Leader (Individual) · Oct 2022 – Sep 2023

- **Numerical Calculation and Performance Optimization of a High-Performance KTN Optical Phase Shifter Based on Si Integrated Optics**

(Si집적광학기반의 고성능 KTN 광위상이동기의 수치계산 및 성능 최적화)

National Research Foundation of Korea (NRF, 한국연구재단), First-Career Research Program (생애 첫 연구사업)

Project Leader · Sep 2021 – Aug 2022

TECHNOLOGY TRANSFER

- **Method for Optically Coupling, Measuring, and Evaluating an Integrated Photonic Chip and an Optical Fiber (Optical Redistribution Layer Design and Measurement Know-How)**

(집적광학칩과 광섬유를 광결합하고, 측정·평가하는 방법 (광재배선층 설계 및 측정 노하우))

Licensee: Dongwoo Fine-Chem Co., Ltd. (동우화인켐(주)) · Contract value: KRW 500 million (5억원) ·

Contract date: Sep 1 2026

Hanyang University ERICA Industry-Academic Cooperation Foundation (한양대에리카 산학협력단) ·

Developer: Prof. Younghyun Kim (김영현 교수)

- **Optical Coupling Engine Device with Alignment-Tolerance-Enhanced Structure Using a Multilayer Stack and Lens (10-2025-0212277) and 1 other**

(다층 적층 구조와 렌즈를 이용한 정렬 공차 보강형 광 결합 광학 엔진 장치)

Licensee: Optoelec Co., Ltd. (주)옵토전자 · Contract value: KRW 500 million (5억원) · Contract date:

Jul 6 2026

Hanyang University ERICA Industry-Academic Cooperation Foundation (한양대에리카 산학협력단) ·

Developer: Prof. Younghyun Kim (김영현 교수)

- **High-Speed C-band/O-band Microring Modulator (MRM) Design, Verification, and Analysis Technology**

(C-band/O-band 고속 마이크로링 변조기(MRM) 설계·검증·분석 기술)

Licensee: PhotoniSol Co., Ltd. (주)포토니솔 · Contract value: KRW 50 million (5천만원) · Contract

date: Jul 1 2026

Hanyang University ERICA Industry-Academic Cooperation Foundation (한양대에리카 산학협력단) ·

Developer: Prof. Younghyun Kim (김영현 교수)

- **Method for Coupling an Integrated Optical Waveguide and an Optical Fiber (10-2024-0122931) and 1 other**

(집적 광도파로와 광섬유를 결합하는 방법)

Licensee: Postech Co., Ltd. (주)포스텍 · Contract value: KRW 500 million (5억원) · Contract date: Sep

1 2025

Hanyang University ERICA Industry-Academic Cooperation Foundation (한양대에리카 산학협력단) ·

Developer: Prof. Younghyun Kim (김영현 교수)

- **Pixel Circuit, Display Device Using the Same, and Manufacturing Method Thereof (10-2022-0159364)**

(픽셀 회로, 이를 이용한 표시장치 및 이의 제조방법)

Licensee: Advanced View Technology Co., Ltd. (주)어드밴스트뷰테크놀러지 · Contract value: KRW 5

million (500만원) · Contract date: Jan 27 2023

Hanyang University ERICA Industry-Academic Cooperation Foundation (한양대에리카 산학협력단) ·
Developer: Prof. Younghyun Kim (김영현 교수)

TEACHING

Conference

- (Technical Seminar, 기술세미나 개최) 2025 Advanced Photonic Packaging Technology Seminar @ Hanyang University ERICA, sponsored by the Next-Generation Intelligent Semiconductor Program (2025 첨단 광패키징 기술세미나 @한양대 ERICA (차세대지능형반도체사업단 후원)), Aug 18 2025 [\[Link\]](#)
- (Tutorial) The Optical Society of Korea (OSK) Summer Conference 2025 (한국광학회 하계학술발표회 2025), "From wafer to Co-packaged optics: A tutorial on silicon photonics integration," 2025.07.09 [\[Link\]](#)
- (Tutorial) The Optical Society of Korea (OSK) Winter Conference 2024 (한국광학회 동계학술발표회 2024), "Harmonizing Light and Silicon: The Art of Integration in Silicon Photonics," 2024.02.15 [\[Link\]](#)
- (Tutorial) Conference on Optoelectronics and Optical Communications, COOC2023 (한국광학회 광전자 및 광통신 학술대회 COOC2023), "Silicon Photonics – Fabrication and Integration Process" (실리콘 포토닉스 - 집적공정), 2023.06.01 [\[Link\]](#)

Lecture

- (Undergraduate) Optoelectronic Devices, Optical Communication Engineering, Semiconductor Device Physics, Semiconductor Device Processing, Engineering Programming, Electromagnetics, Display Engineering
- (Graduate) Integrated Photonics, Semiconductor Advanced Packaging

ACADEMIC SERVICE

- Technical Program Committee Member (Optical Passive Devices and Modules), Optoelectronics and Communications Conference (OECC) [\[Link\]](#)
- Secretary General, Photonics Division, The Optical Society of Korea (OSK, 한국광학회) — 포토닉스 분과, 총무간사 [\[Link\]](#)
- Secretary, Optical Science Division, The Optical Society of Korea (OSK, 한국광학회) — 광과학 분과, 간사 [\[Link\]](#)
- Technical Director (기술이사), Korean Microelectronics and Packaging Society (KMEPS, 한국마이크로전자 및 패키징학회) [\[Link\]](#)

HONORS AND AWARDS

Contribution Award (기여상), The Optical Society of Korea (OSK, 한국광학회) — Photonics Conference 2025, Dec. 3, 2025 [\[Link\]](#)

Contribution Award (기여상), The Optical Society of Korea (OSK, 한국광학회) — Photonics Conference 2024, Nov. 27, 2024 [\[Link\]](#)

President's Award, National Academy of Engineering of Korea (NAEK) — 2021 Campus Patent Universiade Competition (한국공학한림원회장상, 2021년도 캠퍼스 특허 유니버시아드), Nov. 24, 2021 [\[Link\]](#)

Award for Doctoral thesis in School of engineering, EE Dept., Univ. of Tokyo, March 24 2015

Japan Government Scholarship (MEXT) for Ph.D. student, April 2012 - March 2015

Japan Government Scholarship (MEXT) for M.S. student, April 2010 – Mar 2012

Early Graduation in 3 years (Department Rank 1), Tokushima Univ., March 23, 2010

Best student Awards of Nichia Co. for outstanding academic records, Tokushima Univ., June 25 2009

Best student Awards of Nichia Co. for outstanding academic records, Tokushima Univ., July 3 2008

Award for International Communication of English Ability, Tokushima Univ., July 2 2008

Best student Award for courses in liberal arts, Tokushima Univ., April 24 2008

Korea-Japan Government Joint Scholarship, March 2006 – March 2010

PUBLICATION

JOURNAL

- Yongjin Shin, Min Seok Kim, JaeMin Lee, Daehong Kim, Jaekyun Kim, Seong-Yong Cho, SangHoon Shin, and **Younghyun Kim***, "Geometry-Dependent Self-Heating and Wall-Plug Efficiency Degradation in RGB Quantum-Dot LEDs Probed by Thermoreflectance Microscopy", Applied Physics Letters, Vol. 129, Iss. 8, 083505 (2026) [\[Link\]](#)
- Hyeonrak Lim, Seong Kwang Kim, Jinha Lim, Daewon Ha, Jaehoon Han, **Younghyun Kim**, Jaeyong Jeong, and Sanghyeon Kim*, "Uniaxially Compressively Strained Ge (100)-OI p-MOSFET for High-Performance CFET", IEEE Transactions on Electron Devices, Vol. 73, Iss. 7, 4250-4256 (2026) [\[Link\]](#)
- Simin Chen, Taewon Jin, Xinkai Sun, Gijun Ju, Zewei Wang, Jae-Hoon Han, and **Younghyun Kim***, "Unveiling Time-Dependent Dynamics in MFMS FeFETs", IEEE Journal of the Electron Devices Society, Vol. 14, 332-338 (2026) [\[Link\]](#)
- Seokhyeon Yoon, Taewon Jin, Heeyun Jung, and **Younghyun Kim***, "Stitching-loss-tolerant silicon nitride waveguides on glass for panel-level optical interconnects", Optics Letters, Vol. 51, Iss. 7, 1903-1906 (2026) [\[Link\]](#)
- Kangseok Kim, Jonggeon Lee, and **Younghyun Kim***, "Performance Comparison of Coupled-Resonator Optical Waveguide Mach-Zehnder Modulators with III-V SIS Structures", Scientific Reports, Vol. 16, 43882 (2026) [\[Link\]](#)
- Jonggeon Lee, Youngjoo Bae, Minkyu Kim, and **Younghyun Kim***, "A Comparative Study of High-efficiency III-V/Si SIS Ring Modulators for O-band Co-packaged Optics", Optics Communications, Vol. 609, 133106 (2026) [\[Link\]](#)
- Heeyun Jung, Taewon Jin, Seokhyeon Yoon, Kyungjin Jo, Seokyoung Shin, Seungwoo Park, and **Younghyun Kim***, "Demonstration of a SiN Grating Coupler with a Metal Reflector on a Glass Substrate", IEEE Photonics Technology Letters, Vol. 38, Iss. 5, 341-344 (2026) [\[Link\]](#)
- Yongwoo Jeon, Hong Gu Kang, Seohee Park, **Younghyun Kim**, Seong-Yong Cho, Dennis Lee, Younghoon Kim, Sung Nam Lim, Byeong Guk Jeong, Sohee Jeong, Jung Hoon Song, and Ju Young Woo, "Enhanced Carrier Mobility-Driven Performance Improvement in Colloidal Quantum Dot Solar Cells", Inorganic Chemistry Frontiers, Vol. 13, Iss. 5, 1885-1894 (2026) [\[Link\]](#)
- Taewon Jin, Seokhyeon Yoon, Kyungjin Jo, Heeyun Jung, Seokyoung Shin, Jonggeon Lee, Seungwoo Park, Byungou Lee, Wonmyoung Choi, Minchul Jang, Soo-Yong Jung, Myunghwan Kim, Jong Jin Lee, and **Younghyun Kim***, "Silicon Nitride Photonic Platform on Glass for Scalable, High-Density Optical Redistribution Layers in Panel-Level Packaging", Optics Express, Vol. 33, Iss. 24, pp. 50422-50431 (2025) [\[Link\]](#)
- Seoungmin Park, Eun A Kim, Gijun Ju, Sinwon Choi, Hyunji Jeong, Jae-Hoon Han, Dae-Hwan Ahn, Jaekyun Kim, Moonsub Shim, Heesun Yang, Seong-Yong Cho, and **Younghyun Kim***, "Integration

- of Quantum Dot Light-Emitting Diodes and Charge Trap Thin-Film Transistor Arrays for Memory-in-Pixel Applications", ACS Applied Materials & Interfaces (2025) [\[Link\]](#)
- Heeyun Jung, Myung-Joon Kwack, and **Younghyun Kim***, "Simulation study of a highly efficient dual-apodized a-Si/SiN grating coupler using a metal bottom reflector on a glass substrate for co-packaged optics", Japanese Journal of Applied Physics, Vol. 64 (2025) [\[Link\]](#)
 - Hyunji Jeong[‡], Dae-Hwan Ahn[‡], Seoungmin Park, Gijun Ju, Jae-Hoon Han, and **Younghyun Kim***, "Visible Light Wavelength-Dependent Erasing in AOS-Based Charge Trap TFTs for Enhanced Neuromorphic Display Performance", ACS Applied Electronic Materials, Vol. 7, Iss. 12, 5463-5472 (2025) [\[Link\]](#)
 - Hyeonrak Lim, Seong Kwang Kim, Seung Woo Lee, Youngkeun Park, Jaejoong Jeong, Hojin Jeong, Jinha Lim, Dae-Myeong Geum, Jaehoon Han, **Younghyun Kim**, Jaeyong Jeong, Byung Jin Cho, and Sanghyeon Kim, "Heterogeneous 3D Sequential CFET with Strain-Engineered Ge (100) Top-Channel pMOSFET on Bulk Si (100) nMOSFET", IEEE Transactions on Electron Devices, Vol. 72, Iss. 7, 3422-3428 (2025) [\[Link\]](#)
 - Daehong Kim, Jeroen De Coster, Joris Van Campenhout, Yoojin Ban, Dimitrios Velenis, Huseyin Sar, Hakim Kobbi, Rafal Magdziak, and **Younghyun Kim***, "Insertion loss and polarization-dependent loss measurement improvement to enable parallel silicon photonics wafer-level testing", Optics and Lasers in Engineering, Vol. 186 (2025) [\[Link\]](#)
 - Taewon Jin, Kyungjin Jo, Seokhyeon Yoon, Heeyun Jung, Seokyoung Shin, Hyunji Jeong, Kangseok Kim, and **Younghyun Kim***, "Next-Generation Semiconductor Packaging: Status of Co-Packaged Optics based on Silicon Photonics", Journal of the Microelectronics and Packaging Society, Vol. 31, no. 4, 29-36 (2024) [\[Link\]](#)
 - Tae Hyeon Noh[‡], Simin Chen[‡], Hyo-Bae Kim, Taewon Jin, Seoungmin Park, Seong Ui An, Xinkai Sun, Jaekyun Kim, Jae-Hoon Han, Ji-Hoon Ahn^{*}, Dae-Hwan Ahn^{*}, and **Younghyun Kim***, "First demonstration of 2T0C-FeDRAM: a-ITZO FET and double gate a-ITZO/a-IGZO FeFET with record-long multibit retention time of > 4 bits and > 2000 sec", Nanoscale, 2040-3364, 2024 [\[Link\]](#)
 - Seong Ui An[‡], Dae-Hwan Ahn[‡], Gijun Ju, Simin Chen, Yo Seop Ji, Jae-Hoon Han, Jaekyun Kim, and **Younghyun Kim***, "Effect of Source/Drain Electrode Materials on the Electrical Performance and Stability of Amorphous Indium-Tin-Zinc-Oxide FETs", IEEE Transactions on Electron Devices, Vol. 71, Iss. 9, 5422-5437 (2024) [\[Link\]](#)
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