

## ~Curriculum Vitae~

Akira Nagakubo (Date of Birth: 1988, Japan)  
Associate professor



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### 【Education】 z

2014 March D. in Engineering (GPA: 3.8/4.0) Graduate School of Engineering Science, The University of Osaka

2011 March B. in Engineering (GPA: 3.9/4.0) School of Engineering Science, The University of Osaka

### 【Professional experience】

2024 Oct. ~ Associate professor, Tohoku University (Japan)

2018 April – 2024 Sep. Assistant professor, The University of Osaka (Japan)

2017 April – 2018 March Research Fellow of the Japan Society for the Promotion of Science, Kyoto University

2017 April – 2018 March Visiting Scientist. Los Alamos National Laboratory (USA)

2016 Oct. – 2017 March Extraordinary Assistant Professor. The University of Osaka (Japan)

2016 April – 2016 Sep. Visiting Scientist. Los Alamos National Laboratory (USA)

2016 April – 2016 Sep. Adjunct Researcher. The University of Osaka (Japan)

2015 April – 2016 March Extraordinary Assistant Professor. The University of Osaka (Japan)

2012 April – 2015 March Research Fellow of the Japan Society for the Promotion of Science, The University of Osaka

### 【Competitive Honors & Awards】

2022 The University of Osaka Prize for Young Professor, The University of Osaka

2021 IPO Outstanding Reviewer Awards 2021, IOP science

2014 Young Scientist Award at Symposium on Ultrasonic Electronics (10 awardees from 270 presentations)  
The 35th Symposium on Ultrasonic Electronics (USE2014)

2014 37th Young Scientist Oral Presentation Award (40 awardees from 3850 presentations)  
The 75th Japan Society of Applied Physics Autumn Meeting 2014

2013 Encouraging prize for international conference presentation (about a dozen awardees for each year)  
Association for the Advancement of Manufacturing and Technology

2011 Graduate school of Engineering Science prize (The top graduate), The University of Osaka

2010 Eji muto excellent student prize (The top graduate), Japan Society for Design Engineering

2010 School of Engineering Science prize (The top graduate), The University of Osaka

### 【Scholarship (not student loans)】

2012 Excellent educational achievement scholarship, Japan Student Services Organization

2011 Micron scholarship (for excellence in academics and leadership), Micron Technology, Inc.

2008 Cultural education scholarship, The University of Osaka

## 【Grants】

2022 April – 2026 March	Grant in Aid for Scientific Research (B) Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 13.2 million JPY
2022 July – 2024 March	Grant in Aid for Challenging Research (Exploratory) Funding Agency: Japan Science and Technology Agency Amount: 5 million JPY
2021 Jan. – 2029 March	Fusion Oriented REsearch for disruptive Science and Technology Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 50 million JPY
2019 July – 2021 March	Grant in Aid for Challenging Research (Exploratory) Funding Agency: Japan Science and Technology Agency Amount: 4.9 million JPY
2018 April – 2022 March	Grant in Aid for Scientific Research (B) Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 13.8 million JPY
2018 April – 2019 March	Research Grant Funding Agency: Murata Manufacturing Co., Ltd. Funding Agency Amount: 2.45 million JPY
2017 April – 2018 March	Grant in Aid for JSPS Fellows Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 1.1 million JPY
2015 April – 2017 March	Grant in Aid for Young Scientists (B) Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 3.2 million JPY
2012 April – 2015 March	Grant in Aid for JSPS Fellows Funding Agency: Japan Society for the Promotion of Science (JSPS) Amount: 3 million JPY

## 【Publications (peer reviewed)】

- 1) **A. Nagakubo**, T. Matsukura, and H. Ogi  
"Sensitivity enhancement of hydrogen-gas sensor by sub nm Au on Pd surface of a wireless quartz resonator"  
Jpn. J. Appl. Phys. **63**, 074002 (2024).
- 2) N. Fujiwara, S. Y. Tan, T. Matsumoto, **A. Nagakubo**, M. Kinooka, and H. Ogi  
"Development of a focused-ultrasound spectroscopic-imaging system combined with optical imaging for applying mechanical stimulation on living cells and the possibility of selective stimulation for the nucleus"  
Jpn. J. Appl. Phys. **63**, 03SP65 (2024).

- 3) W. Yuan, **A. Nagakubo**, O. B. Wright, and H. Ogi  
"GHz surface-wave phononic crystal biosensor using a Fano resonance at the bandgap edge"  
Jpn. J. Appl. Phys. **63**, 017006 (2024).
- 4) H. Fukuda, **A. Nagakubo**, S. Usami, M. Imanishi, Y. Mori, and H. Ogi  
"Elastic constants of GaN grown by the oxide vapor phase epitaxy method"  
Appl. Phys. Express **17**, 016501 (2024).
- 5) H. Fukuda, **A. Nagakubo**, O. B. Wright, K. Kyotani, and H. Ogi  
"Deep-Learning-Assisted Resonant Ultrasound Spectroscopy for Cubic Solids"  
Phys. Rev. Applied **20**, 034048 (2023).
- 6) W. Yuan, **A. Nagakubo**, O. B. Wright, and H. Ogi  
"High sensitivity biosensing scheme based on a GHz phononic crystal waveguide"  
Jpn. J. Appl. Phys. **62**, SJ1012 (2023).
- 7) H. Fukuda, **A. Nagakubo**, S. Usami, M. Ikeda, M. Imanishi, M. Yoshimura, Y. Mori, K. Adachi, and H. Ogi  
"Determination of the electron trap level in Fe-doped GaN by phonon-assisted conduction phenomenon"  
Appl. Phys. Express **15**, 071003 (2022).
- 8) H. K. Weng, **A. Nagakubo**, H. Watanabe, and H. Ogi  
"Suppression of Brillouin oscillation in transparent free-standing diamond thin films in picosecond ultrasound"  
Appl. Phys. Lett. **120**, 112203 (2022).
- 9) W. Yuan, **A. Nagakubo**, and H. Ogi  
"Effect of interfacial damping on high-frequency surface wave resonance on a nanostrip-bonded substrate"  
J. Appl. Phys. **131**, 015103 (2022).
- 10) H. K. Weng, **A. Nagakubo**, H. Watanabe, and H. Ogi  
"Lattice thermal conductivity in isotope diamond asymmetric superlattices"  
Jpn. J. Appl. Phys. **61**, SG1004 (2022).
- 11) **A. Nagakubo**, K. Kanai, H. Tamura, A. Tange, and H. Ogi  
"Variable repetition frequency asynchronous optical sampling method without a feedback loop"  
AIP Adv. **12**, 045323 (2022).
- 12) K. Tojo, **A. Nagakubo**, and H. Ogi  
"The angular dependence of magnetization dynamics induced by a GHz range strain pulse"  
Jpn. J. Appl. Phys. **61**, SG1007 (2022).
- 13) H. K. Weng, **A. Nagakubo**, H. Ogi, and H. Watanabe  
"Phonon propagation in isotopic diamond superlattices"  
Phys. Rev. B **104**, 054112 (2021).
- 14) L. Zhou, F. Kato, **N. Nakamura**, Y. Oshikane, A. Nagakubo, and H. Ogi  
"MEMS hydrogen gas sensor with wireless quartz crystal resonator"  
Sensor Actuat. B: Chem. **334**, 129651 (2021).
- 15) H. Fukuda, **A. Nagakubo**, and H. Ogi  
"Elastic constant of dielectric nano-thin films using three-layer resonance studied by picosecond ultrasonics"  
Jpn. J. Appl. Phys. **60**, SDDA05 (2021).
- 16) H. K. Weng, **A. Nagakubo**, H. Watanabe, and H. Ogi  
"Thermal conduction in isotope diamond thin films studied by pump-probe laser reflectivity measurement"  
Jpn. J. Appl. Phys. **59**, SKKA04 (2020).

- 17) L. Zhou, N. Nakamura, **A. Nagakubo**, and H. Ogi  
"Enhancement of sensitivity of Pd-based hydrogen-gas sensor by plasma exposure studied by wireless quartz resonator"  
Jpn. J. Appl. Phys. **59**, SKKB02 (2020).
- 18) K. Kusakabe, A. Wake, **A. Nagakubo**, K. Murashima, M. Murakami, K. Adachi, and H. Ogi  
"Interplanar stiffness in defect-free monocrystalline graphite"  
Phys. Rev. Materials **4**, 043603 (2020).
- 19) **A. Nagakubo**, H. T. Lee, H. Ogi, T. Moriyama, and T. Ono  
"Elastic constants of beta tungsten thin films studied by picosecond ultrasonics and density functional theory "  
Appl. Phys. Lett. **116**, 021901 (2020).
- 20) **A. Nagakubo**, K. Adachi, T. Nishihara, and H. Ogi  
"GHz-range resonant ultrasound spectroscopy for a free-standing nano film studied by picosecond ultrasonics"  
Appl. Phys. Express **13**, 016504 (2020).
- 21) L. Zhou, N. Nakamura, **A. Nagakubo**, and H. Ogi  
"Highly sensitive hydrogen detection using curvature change of wireless-electrodeless quartz resonators"  
Appl. Phys. Lett. **115**, 171901 (2019).
- 22) H. Ogi, S. Iwagami, **A. Nagakubo**, T. Taniguchi, and T. Ono  
"Nano-plate biosensor array using ultrafast heat transport through proteins."  
Sensor Actuat. B: Chem. **278**, 15 (2019).
- 23) **A. Nagakubo**, S. Tsuboi, Y. Kabe, S. Matsuda, A. Koreeda, Y. Fujii, and H. Ogi  
"Zero temperature coefficient of sound velocity in vitreous silicon oxynitride thin films"  
Appl. Phys. Lett. **114**, 251905 (2019).
- 24) S. Tsuboi, K. Adachi, **A. Nagakubo**, and H. Ogi  
"Theoretical study on elastic properties of Si<sub>2</sub>N<sub>2</sub>O by ab initio calculation"  
Jpn. J. Appl. Phys. **57**, 07LB04 (2018).
- 25) E. Oishi, Y. Fujii, D. Katayama, A. Koreeda, **A. Nagakubo**, and H. Ogi  
"Phonon anharmonicity in zirconium tungstate single crystal investigated by broadband light scattering"  
Jpn. J. Appl. Phys. **56**, 10PB06 (2017).
- 26) H. Ogi, T. Ishihara, H. Ishida, **A. Nagakubo**, N. Nakamura, and M. Hirao, "Thermal Mode Spectroscopy for Thermal Diffusivity of Millimeter-Size Solids", Phys. Rev. Lett. **117**, 195901 (2016). – published online 4 November, 2016
- 27) K. Adachi, H. Ogi, **A. Nagakubo**, N. Nakamura, M. Hirao, M. Imade, M. Yoshimura, and Y. Mori  
"Piezoelectric coefficients of GaN determined by hopping conduction of carriers"  
Appl. Phys. Lett. **109**, 182108 (2016).
- 28) K. Adachi, H. Ogi, **A. Nagakubo**, N. Nakamura, M. Hirao, M. Imade, M. Yoshimura, and Y. Mori  
"Elastic constants of GaN between 10 and 305 K"  
J. Appl. Phys. **119**, 245111 (2016).
- 29) **A. Nagakubo**, M. Arita, H. Ogi, H. Sumiya, N. Nakamura, and M. Hirao  
"Elastic constant  $C_{11}$  of <sup>12</sup>C diamond between 10 and 613 K"  
Appl. Phys. Lett. **108**, 221902 (2016).
- 30) H. Ogi, S. Masuda, **A. Nagakubo**, N. Nakamura, M. Hirao, K. Kondou, and T. Ono  
"Impact of interface stiffness in surface-wave resonances on nano-strip-attached substrates"

Phys. Rev. B **93**, 024112 (2016).

- 31) **A. Nagakubo**, H. Ogi, and M. Hirao  
“Refractive index and extinction coefficient of Si at 400 nm between 10 and 300 K”  
Jpn. J. Appl. Phys. **54**, 128001 (2015).
- 32) **A. Nagakubo**, H. Ogi, H. Ishida, M. Hirao, T. Yokoyama, and T. Nishihara  
“Temperature behavior of sound velocity of fluorine-doped vitreous silica thin films studied by picosecond ultrasonics”  
J. Appl. Phys. **118**, 014307 (2015).
- 33) **A. Nagakubo**, M. Arita, T. Yokoyama, S. Matsuda, M. Ueda, H. Ogi, and M. Hirao  
“Acoustic properties of co-doped AlN thin films at low temperatures studied by picosecond ultrasonics”  
Jpn. J. Appl. Phys. **54**, 07HD01 (2015).
- 34) H. Ogi, Y. Tsutsui, N. Nakamura, **A. Nagakubo**, M. Hirao, M. Imade, M. Yoshimura, and Y. Mori  
“Hopping conduction and piezoelectricity in Fe-doped GaN studied by non-contacting resonant ultrasound spectroscopy”  
Appl. Phys. Lett. **106**, 091901 (2015).
- 35) **A. Nagakubo**, H. Ogi, H. Sumiya, and M. Hirao  
“Elasticity and hardness of nano-polycrystalline boron nitrides: The apparent Hall-Petch effect”  
Appl. Phys. Lett. **105**, 081906 (2014).
- 36) M. Tane, Y. Okuda, Y. Todaka, H. Ogi, and **A. Nagakubo**  
“Elastic properties of single-crystalline  $\omega$  phase in titanium”  
Acta Mater. **61**, 7543 (2013).
- 37) **A. Nagakubo**, H. Ogi, H. Sumiya, K. Kusakabe, and M. Hirao  
“Elastic constants of cubic and wurtzite boron nitrides”  
Appl. Phys. Lett. **102**, 241909 (2013).
- 38) **A. Nagakubo**, A. Yamamoto, K. Tanigaki, H. Ogi, N. Nakamura, and M. Hirao  
“Monitoring of the Low-Temperature Phase Transitions of SrTiO<sub>3</sub> Using Picosecond Ultrasound Spectroscopy”  
Jpn. J. Appl. Phys. **51**, 07GA09 (2012).
- 39) **A. Nagakubo**, K. Tanigaki, H. Ogi, M. Hirao, H. Sumiya and K. Harano  
“Picosecond Ultrasound Spectroscopy for High Purity Boron Nitrides”  
Proceedings of ATEM’11, OS02F023(2011)

### **【Invited Talks/ Presentations/ Seminars】**

- 1) Seminar, “Sub-THz pump-probe ultrasonics using femtosecond pulsed laser”, 8th(Mon.) March, 2016, Kyoto University, Kyoto, Japan
- 2) International seminar, “Elasticity measurements by Picosecond ultrasound spectroscopy”, 18th(Mon.) May 2015, Academy of Sciences of the Czech Republic, Prague, Czech Republic
- 3) The 62nd JSPS (the Japan Society of Applied Physics) Spring Meeting 2015, “Low-temperature carrier dynamics in different-carrier-concentration GaN studied by picosecond ultrasound spectroscopy”, 11th(Wen.) – 14th(Sta.), Tokai University, Kanagawa, Japan

## **【Presentations at international conference】**

- 1) IEEE SENSORS 2024  
Co-organizer of "Acoustic and Electromagnetic Sensors and Sensing Technologies for Extreme Environments"  
20th(Sun.) - 23th(Wed.) Oct. 2024, Kobe Portopia Hotel, Hyogo, Japan
- 2) Acoustics 2023 Sydney (185th Meeting of the Acoustical Society of America)  
Co-organizer of "Acoustical Measurements and Sensors for Challenging Environments"  
4th(Mon.) - 8th(Fri.) Dec. 2023, International Convention Centre Sydney, Sydney, Australia
- 3) 184th Meeting of the Acoustical Society of America  
"In situ monitoring of electromigration in a single nano wire by picosecond ultrasonics"  
8th(Mon.) - 12th(Fri.) May. 2023, Chicago Downtown Marriott Magnificent Mile Hotel, Illinois, USA
- 4) 2022 IEEE International Ultrasonics Symposium  
"GHz phonon biosensor using free-standing SiN nanofilm with real-time monitoring by asynchronous optical sampling picosecond ultrasonics"  
10th(Mon.) - 13th(Thu.) Oct. 2022, Venice Conference Center, Venice, Italy
- 5) 2019 IEEE International Ultrasonics Symposium  
"Relationship between Temperature Coefficient of Sound Velocity and Bond Angle in Vitreous SiO<sub>2</sub>-Type Films"  
6th(Sun.) - 9th(Wed.) Oct. 2019, SEC, Glasgow, Scotland, UK
- 6) 2019 International Congress on Ultrasonics  
"Time-range controllable asynchronous picosecond ultrasonics with titanium-sapphire pulse lasers"  
3rd(Tue.) Sep. - 6th(Fri.) Sep. 2019, Hawaii Convention Center, Honolulu, USA
- 7) The 39th Symposium on Ultrasonic Electronics  
"Resonance frequencies of AlN and metal freestanding multilayers studied by picosecond ultrasonics"  
29th(Mon.) Oct. - 31th(Wed.) Oct. 2018, Doshisha University, Kyoto, Japan
- 8) 2017 International Congress on Ultrasonics  
"Guide wave excitation and detection in a single nanowire"  
18th(Mon.) Dec. - 20th(Wed.) Dec. 2017, Hawaii Convention Center, Honolulu, USA
- 9) The 38th Symposium on Ultrasonic Electronics  
"Elastic constant of alpha and beta tungsten films studied by picosecond ultrasonics"  
25th(Wed.) Oct. - 27th(Fri.) Oct. 2017, Tagajo City Cultural Center, Miyagi, Japan
- 10) 5th Joint Meeting of the Acoustical Society of America and Acoustical Society of Japan  
"Discussion on very small temperature dependence of diamond's elastic constants"  
28th(Mon.) Nov. - 2nd(Fri.) Dec. 2016, Hilton Hawaiian Village Waikiki Beach Resort, Honolulu, USA
- 11) The 37th Symposium on Ultrasonic Electronics  
"Wave-propagation properties of alpha and beta Lanthanum studied by ab-initio calculations"  
16th(Wed.) - 18th(Fri.) Nov. 2016, Pukyong National University, Busan, Korea
- 12) The 36th Symposium on Ultrasonic Electronics  
"Guided wave propagation in a 2-D patterned nano-bridge studied by picosecond ultrasonics"  
5th(Thurs.) - 7th(Sat.) Nov. 2015, Epochal Tsukuba, Ibaraki, Japan
- 13) 9th International Conference on New Diamond and Nano Carbons 2015  
"The apparent Hall-Petch effect of nano-polycrystalline cubic boron nitrides"  
24th(Sun.) - 28th(Thurs.) May 2015, Shizuoka GRANSHIP, Shizuoka, Japan
- 14) 2015 International Congress on Ultrasonics

- “Precise measurement of sound velocity of amorphous silica at low temperatures by picosecond ultrasounds: correction of static heating effect”  
10th(Sun.) - 14th(Thurs.) May 2015, Arsenal, Metz, France
- 15) TMS (The Minerals, Metals and Materials Society) 2015, 144th annual Meeting  
“Elastic Stiffness of Cubic and Wurtzite Boron Nitride”  
15th(Mon.) - 19th(Thurs.) March 2015, Walt Disney World Swan and Dolphin Resort, Orland, Florida, USA
- 16) The 35th Symposium on Ultrasonic Electronics  
“Acoustic properties of co-doped AlN thin films at low temperatures studied by picosecond ultrasonic”  
3rd(Wed.) - 5th(Fri.) Dec. 2014, Meiji University, Tokyo, Japan
- 17) 2014 IEEE International Ultrasonics Symposium  
“Temperature coefficients of fluorine-doped amorphous-SiO<sub>2</sub> thin films measured by picosecond ultrasonic”  
3rd(Thurs.) - 6th(Mon.) September 2014, Hilton Hotel Chicago, Chicago, Illinois, USA
- 18) The 34th Symposium on Ultrasonic Electronics  
“Acoustic properties of fluorine-doped silica-glass thin films at low temperatures”  
20th(Wed.) - 22th(Fri.) Nov. 2013, Doshisha University, Kyoto, Japan
- 19) 2013 International Congress on Ultrasonics  
“Measurement and Calculation of Elastic Constants of Boron Nitrides”  
2nd(Wed.) - 5th(Sun.) May 2013, Grand Copthorne Waterfront Hotel, Singapore, Singapore
- 20) The 33rd Symposium on Ultrasonic Electronics  
“Sub-terahertz-frequency attenuation and sound velocity of GaN at Cryogenic Temperatures Studied by Picosecond Ultrasound Spectroscopy”  
13th(Tue.) - 15th(Thurs.) Nov. 2012, Chiba University, Chiba, Japan
- 21) Quantitative Nondestructive Evaluation (QNDE) 2012  
“Study of Phase Transition in SrTiO<sub>3</sub> Using Ultrasonic Attenuation at Sub-Terahertz Region”  
15th(Mon.) - 20th(Fri.) July. 2012, Hyatt Regency Denver Tech Center, Denver, Colorado, USA
- 22) Materials Research Society(MRS) Fall Meeting 2011  
“Elastic Constants of Boron Nitrides at Cryogenic Temperature”  
28th(Mon.) Nov. - 2nd(Fri.) Dec. 2011, Hynes Convention Center, Boston, Massachusetts, USA
- 23) The 32nd Symposium on Ultrasonic Electronics  
“Monitoring of sound velocity and attenuation in SrTiO<sub>3</sub> across the phase transition at low temperature using picosecond ultrasounds”  
8th(Tue.) - 10th(Thurs.) Nov. 2011, Kyoto University, Kyoto, Japan
- 24) International Conference on Advanced Technology in Experimental Mechanics 2011 (ATEM10)  
“Picosecond Ultrasound Spectroscopy for High Purity Boron Nitrides”  
19th(Mon.) - 21th(Wed.) Sep. 2011, Kobe International Conference Center, Kobe, Japan
- 25) 5th International Conference on New Diamond and Nano Carbons 2011 Secretariat  
“Elasticity of High Purity Boron Nitrides at Cryogenic Temperatures Studied by Picosecond Laser Ultrasound and ab-initio Calculation”  
16th(Mon.) - 20th(Fri.) May 2011, Kunibiki Messe, Shimane, Japan