

Larry Coldren

From Ultrasonics
To PICs To VCSELS

John Bowers



A Long and Illustrious Career...

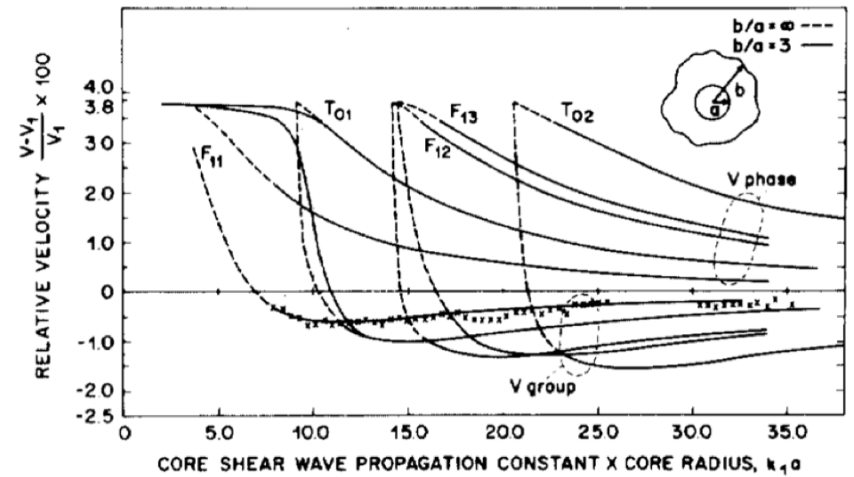
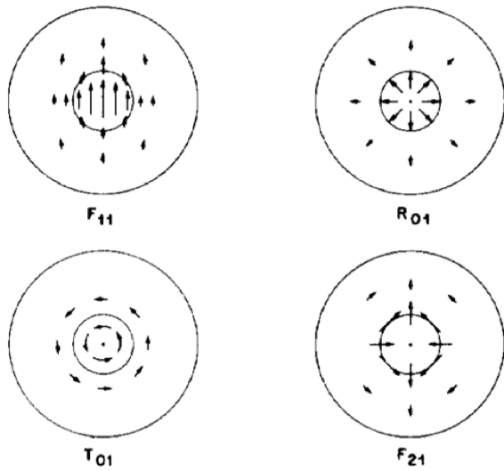
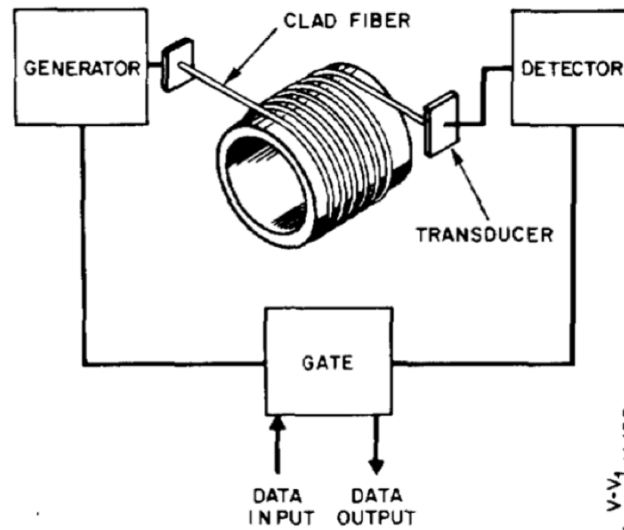
Fibers!

- Larry has worked in fiber optics for decades...
- But he started long, long ago in acoustic fibers...

“Acoustic Cladded Fiber Delay Lines,”
G.D. Boyd, L.A. Coldren, and R.N. Thurston

Acoustic Clad Fiber Delay Lines

GARY D. BOYD, FELLOW, IEEE, LARRY A. COLDREN, SENIOR MEMBER, IEEE,
AND ROBERT N. THURSTON, SENIOR MEMBER, IEEE



Amplifiers

- Optical amplifiers part of a key patent on Tunable lasers
- But, Larry started on amplifiers long, long ago...
 - Not at 200 THz, but at 200 MHz...

MONOLITHIC ACOUSTIC SURFACE-WAVE AMPLIFIER*

L. A. Coldren

Stanford University, Stanford, California 94305

and

Bell Telephone Laboratories, Murray Hill, New Jersey 07974

and

G. S. Kino

Stanford University, Stanford, California 94305

(Received 29 December 1970; in final form 15 February 1971)

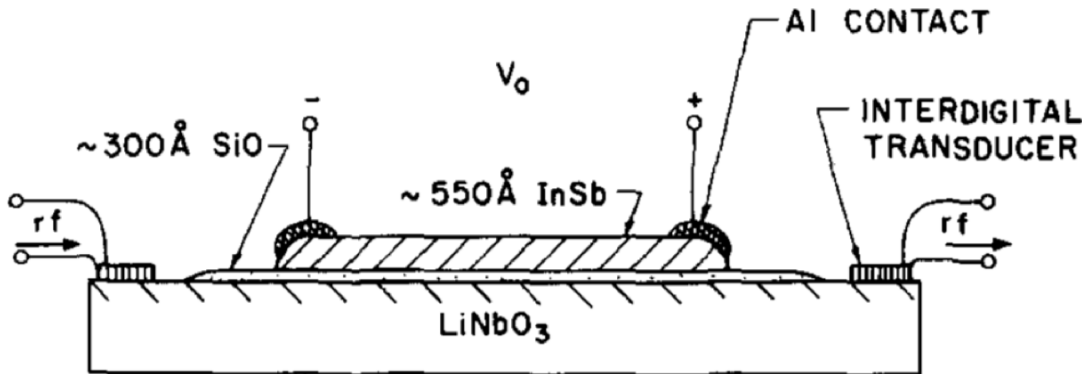


FIG. 1. Amplifier configuration.

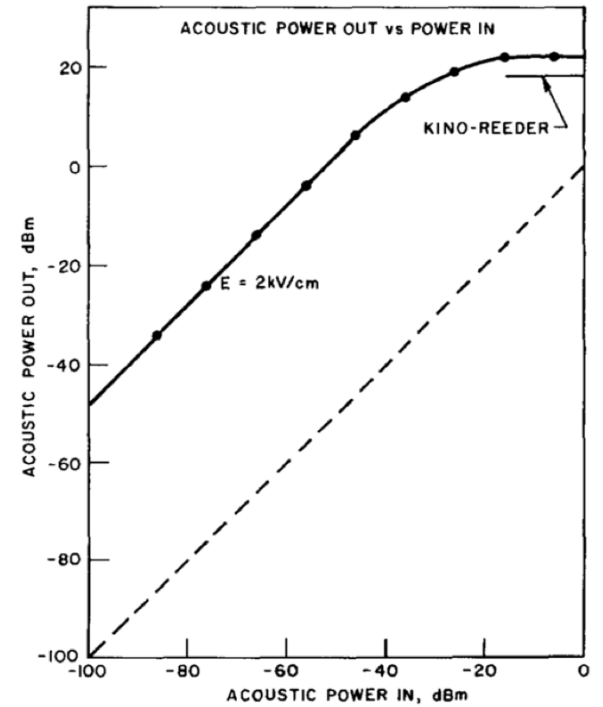


FIG. 3. Plot of acoustic power out as a function of power in.

First Conference Overlap: 1980

“Broader-Band SAW Resonator Filters with a Single Critical Masking Step,” R.L. Rosenberg and L.A. Coldren *Proceedings 1980 Ultrasonics Symposium, G5, IEEE, New York.*

H.C. Tuan, J. E. Bowers, and G. S. Kino, “Theoretical and Experimental Results for Monolithic SAW Memory Correlators,” *IEEE Transactions on Sonics and Ultrasonics*, **27** (6), 360-369, November 1, 1980

From First to Latest Joint Paper....

J. E. Bowers, L. A. Coldren, B. R. Hemenway, B. I. Miller and R. J. Martin, “1.55 μm Multisection Ridge Lasers,” *Electronic Letters*, **19** (14), 523-525, July 7, 1983



100 joint papers later

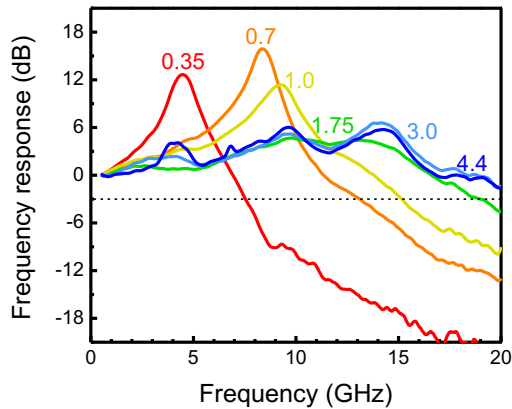
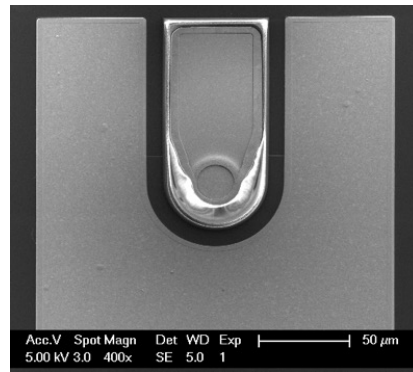
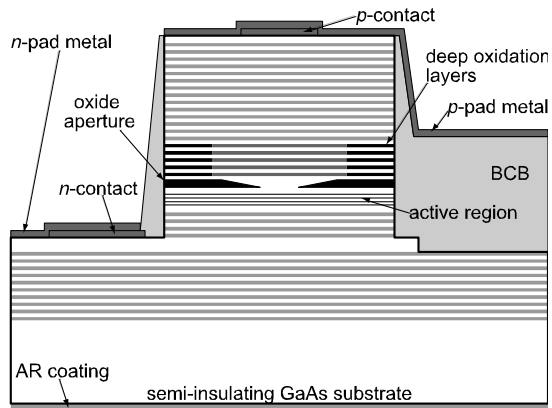
On topics from Lasers, Processing, VCSELs, PICs...

T. Komljenovic, R. Helkey, L. Coldren, and J. E. Bowers, “Sparse aperiodic arrays for optical beam forming and LIDAR”, *Optics Express*, **(25)**3, 2511-2528, February 6, 2017

P. J. M. Suni, J. Bowers, L. Coldren, S.J. B. Yoo, J. Colosimo, “Coherent Lidar-On-A-Chip”, National Aerospace & Electronics Conference (NAECON) 2017.

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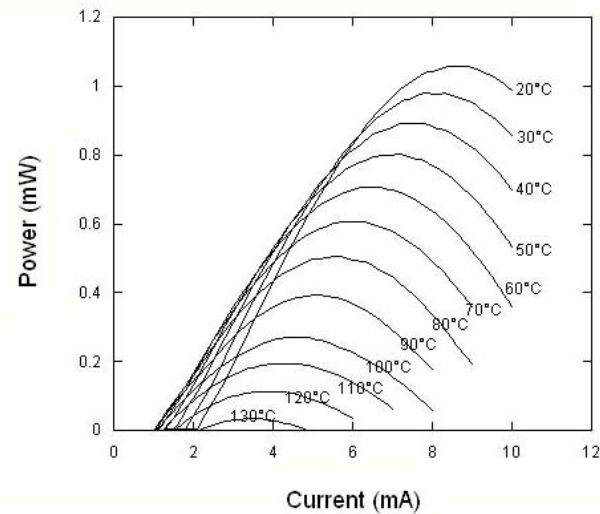
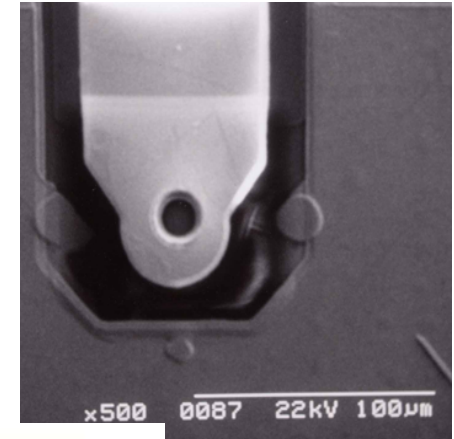
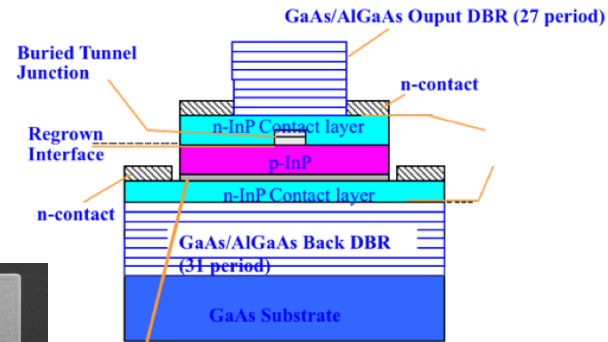
Short Wavelength VCSELs



GaAs

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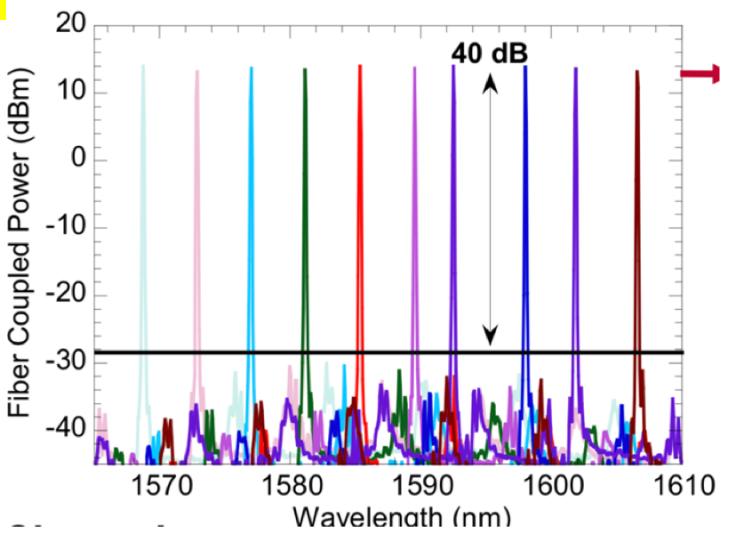
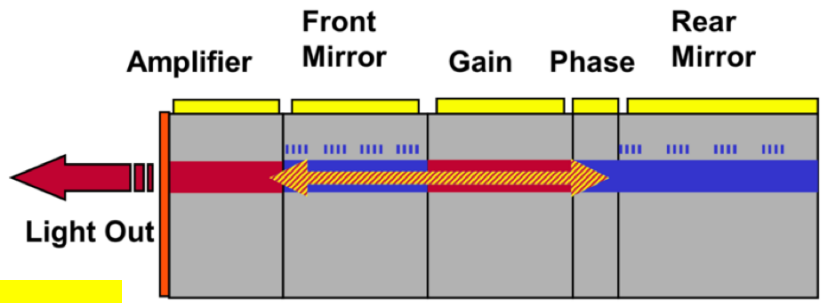
Long Wavelength VCSELs



InP

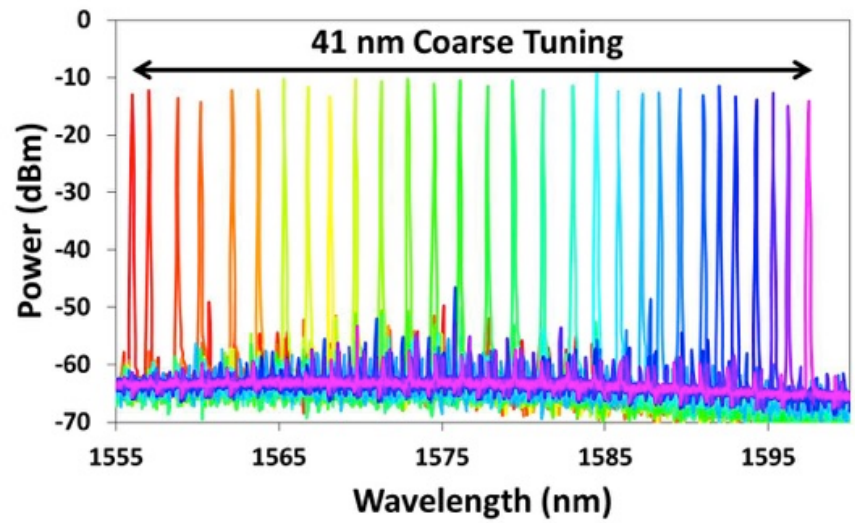
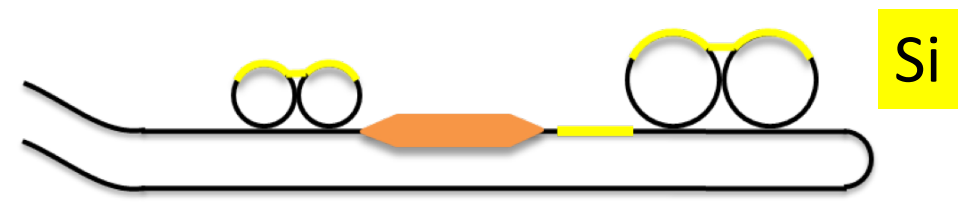
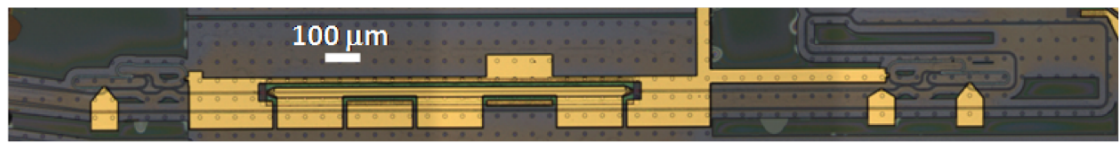
Larry Coldren

SGDBR Tunable Lasers



John Bowers

Ring Cavity Tunable Lasers



Thank you, Larry!

