Introducing Dark Mode

Raymond Sepulveda, Human Interface Design
Rachel Goldeen, Cocoa Frameworks
Taylor Kelly, Cocoa Frameworks
Hi John,

We just got back from our trip to Vietnam and I wanted to share some of our photos with you. We backpacked around the country for two weeks and had an experience we’ll never forget. The people were all incredibly friendly and welcoming.

Let’s schedule a lunch date soon so that we can catch up. I’ll show you the rest of the pictures!

Raymond

Hi Raymond,

Glad you guys enjoyed your trip to Vietnam. It’s a beautiful country with warm and friendly people. I’m glad you got to see some of the beautiful landscapes.

John
Backyard planting ideas

Ideas for greenery in the backyard and on the back garage wall.
- Use native plants wherever possible
- Ensure irrigation access needed
- Can we install wire mesh on the back wall for vines to cling to?

Notes:
- Side yard gets lots of sun. Could be good for a patchwork of succulents like this.

Hanging vine on top of door w/ star jasmine on the right. Star jasmine might be good for our location.
<table>
<thead>
<tr>
<th>Setting</th>
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<td>Appearance</td>
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<td>Blue, Gray, Orange</td>
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<tr>
<td>Use LCD font smoothing when available</td>
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Design Principles
Dark interfaces are not just inverted. Dark interfaces are cool. Dark Mode is content-focused.
Dark interfaces are cool

Dark interfaces are not just inverted

Dark Mode is content-focused
Dark interfaces are cool
Dark interfaces are cool
Dark interfaces are slick
Dark interfaces are professional
Dark interfaces are futuristic
Dark interfaces are beautiful
Dark interfaces are not just inverted

Dark interfaces are cool

Dark Mode is content-focused
Dark interfaces are cool

Dark interfaces are not just inverted

Dark Mode is content-focused
Opposite visual cues
Dark interfaces are cool
Dark interfaces are not just inverted
Dark Mode is content-focused
Dark interfaces are not just inverted

Dark interfaces are cool

Dark Mode is content-focused
Japanese Tea Ceremony

The Japanese tea ceremony is called chado, zashiki, or ochi. It is a ritual that was developed hundreds of years ago and involves the preparation and serving of a green tea called matcha.

However, the ceremony is not just about drinking tea. It’s about building bonds of friendship in a pleasant, relaxing environment. And creating a balance between the material things in life and our inner selves. The ultimate aim of the tea ceremony is to attain deep spiritual satisfaction through ritual and contemplation.

Over the centuries, the tea ceremony has been politically significant. In the sixteenth century, it was used by powerful leaders who fought to unify different parts of Japan. Oda Nobunaga, a powerful samurai warrior, used the tea ceremony to win over worthy merchants. And later, Toyotomi Hideyoshi (famed as one of Japan’s great unifiers) used the ceremony as a political tool to entertain allies.

The tea ceremony is popular with rich and poor alike. In this way, it has played an important part in unifying the Japanese people.
Hi John! We just got back from our trip to Vietnam and I wanted to share some of our photos with you. We backpacked through the country for two weeks and had an experience we'll never forget. The people were all incredibly friendly and we made a lot of new friends as we traveled around the country. You should join us next time!

Let's schedule a lunch date soon so that we can catch up. I'll show you the rest of the trip photos then!
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<td>Light Appearance, All Accent Colors</td>
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Design Considerations
Working with Colors
Designing with Vibrancy
Translucent material

Non-vibrant content

Vibrantly blended content
### Opacity Construction

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**Secondary Label Color**

**Tertiary Label Color**

**Quaternary Label Color**
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# Grayscale Construction

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Artistically Inverting Glyphs
Recap
Dark interfaces are cool

Dark interfaces are not just inverted

Dark Mode is content-focused
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Colors
Vibrancy
Glyphs
Vibrancy

Colors

Glyphs
Colors
Vibrancy
Glyphs
Human Interface Guidelines

macOS Design Themes

Four primary themes differentiate macOS apps from iOS, tvOS, and watchOS apps. Keep these themes in mind as you imagine your app's identity.

Flexible
People expect macOS apps to be intuitive, while simultaneously adaptable to their

Expansive
Large, high-resolution displays are typical for most Mac users, and people often
Apple Design Resources

Design apps quickly and accurately by using Sketch, Photoshop and XD templates, guides and other resources.
Human Interface Guidelines

macOS

Apple UI Design Resources for macOS include Sketch and Photoshop templates for Touch Bar glyphs.

View the macOS design guidelines

watchOS

Apple UI Design Resources for watchOS include Sketch and Photoshop dynamic type guides, layout specifications, app templates, Apple Watch bezels, and other UI materials. An installer for SF Compact, the system typeface for watchOS, is also included.

View the watchOS design guidelines

To download watchOS device frames for use when marketing your app, see App Store Marketing Guidelines.
Human Interface Guidelines

macOS  Available End of June

Apple UI Design Resources for macOS include Sketch and Photoshop templates for Touch Bar glyphs.

View the macOS design guidelines

Download for Sketch  (576 KB)

Download for Photoshop  (1.1 MB)

watchOS

Apple UI Design Resources for watchOS include Sketch and Photoshop dynamic type guides, layout specifications, app templates, Apple Watch bezels, and other UI materials. An installer for SF Compact, the system typeface for watchOS, is also included.

View the watchOS design guidelines

Download for Sketch  (1.3 KB)

Download for Photoshop  (18.1 KB)

To download watchOS device frames for use when marketing your app, see App Store Marketing Guidelines.
Adopting Dark Mode

Rachel Goldeen, Cocoa Frameworks
Taylor Kelly, Cocoa Frameworks
Chameleon Wrangler
Colors
Colors
box.fillColor = NSColor(srgbRed:0.58 green:0.97 blue:0.76 alpha:1.0)
box.fillColor = NSColor(srgbRed:0.58 green:0.97 blue:0.76 alpha:1.0)
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Benefits

Meaningful names
Asset Catalog Benefits

Meaningful names

Multiple definitions
Asset Catalog Benefits

Meaningful names

Multiple definitions

Central location
Asset Catalog Editor in Xcode

Assets.xcassets
box.fillColor = NSColor(named: "headerColor")
Dynamic System Colors

Many NSColors are dynamic
Dynamic System Colors

Many NSColors are dynamic

Color resolved at draw time
Dynamic

labelColor
secondaryLabelColor
tertiaryLabelColor
quaternaryLabelColor

Static

black
black @55%
black @25%
black @10%
Here are some of the pictures that John and I took on vacation to Thailand last su...
Dynamic System Colors

Interface Builder
Dynamic
- systemRed
- systemYellow
- systemGreen

Static
- red
- yellow
- green
linkColor

www.apple.com

go someplace

systemBlue

perform action

controlAccentColor

match system controls
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textColor
textBackgroundColor
selectedTextColor
selectedTextBackgroundColor
Accessibility

General
- Invert colors
- Use grayscale
- Differentiate without color
- Reduce motion
- Increase contrast
- Reduce transparency
- Display contrast:
- Normal
- Maximum
- Cursor size:
- Normal
- Large
- Shake mouse pointer to locate
  Quickly move the mouse pointer back and forth to make it bigger.

Display resolution and brightness can be adjusted in Display preferences:
Open Display Preferences...
Asset Catalog Editor in Xcode

Assets.xcassets
Asset Catalog Editor in Xcode

Assets.xcassets

- Dark Appearance Normal Contrast
- Dark Appearance High Contrast

Devices:
- Universal
- iPhone
- iPad
- Apple Watch
- Apple TV
- Mac

Appearances:
- Any, Dark
- High Contrast

Gamut:
- Any

Color:
- Color Space: Display P3
- Color: Custom
- Input Method: Floating point (0.0-1.0)
- Pad: 0.103
Asset Catalog Editor in Xcode

Assets.xcassets

- Dark Appearance
  - Normal Contrast
  - High Contrast

Devices:
- Universal
- iPhone
- iPad
- Apple Watch
- Apple TV
- Mac

Appearances:
- Any, Dark
- High Contrast

Gamut:
- Any

Color Space:
- Display P3

Color:
- Custom

Input Method:
- Floating point (0.0–1.0)

Padding:
Images
Image border provides a strong outline.
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Editor in Xcode

Assets.xcassets
Image border stands out from dark background.
Asset Catalog Editor in Xcode
Assets.xcassets
Asset Catalog Editor in Xcode
Assets.xcassets
Template Images

Transparency maintained
Template Images

Transparency maintained

Color ignored
Template Images

Transparency maintained

Color ignored

Bitmaps or PDFs
Template Images
Original image on a checkerboard background
Template Images
Original image on a checkerboard background

Partial transparency
Template Images
Secondary Label Color in a window
Template Images
Button state can change color
Template Images
Button state can change color
Template Images
Button state can change color

Disabled button images are dimmer
Content Tint Color

Custom template tint colors

NSImageView: Image

NSButton: Image and title

@available(OSX 10.14, *)
open var contentTintColor: NSColor?
sadButton.contentTintColor = NSColor(named: "SadTint")
nutralButton.contentTintColor = NSColor(named: "NeutralTint")
happyButton.contentTintColor = NSColor(named: "HappyTint")
sadButton.contentTintColor = NSColor(named: "SadTint")
normalButton.contentTintColor = NSColor(named: "NeutralTint")
happyButton.contentTintColor = NSColor(named: "HappyTint")
sadButton.contentTintColor = .systemRed
neutralButton.contentTintColor = .systemYellow
happyButton.contentTintColor = .systemGreen
sadButton.contentTintColor = .systemRed
neutralButton.contentTintColor = .systemYellow
happyButton.contentTintColor = .systemGreen
Chloe
2 years old

Birth name: Chiosaurus Rex
Birth date: 5/18/2018
Species: Veiled Chameleon
Length: 30 cm
Weight: 3.2 oz
Tongue velocity: 4.2 m/s

Cricket intake: 5 to 10
Favorite berry: Blueberry
Water intake: 2 mL

Preferred temperature: 31 °C
Excitement level: Low
Courtship behavior: Head Roll

Notes:
Omnivorous
Accent and Highlight Colors

controlAccentColor — custom control accents

selectedContentBackgroundColor — background of table rows, etc

selectedTextBackgroundColor — background of selected text
Accent and Highlight Colors

controlAccentColor — custom control accents

selectedContentBackgroundColor — background of table rows, etc

selectedTextBackgroundColor — background of selected text
let selectedBackgroundColor = NSColor.systemBlueColor
let selectedBackgroundColor = NSColor.controlAccentColor
let selectedBackgroundColor = NSColor.controlAccentColor
let selectedBackgroundColor = NSColor.controlAccentColor
let selectedBackgroundColor = NSColor.controlAccentColor
let selectedBackgroundColor = NSColor.controlAccentColor
let pressedBackgroundColor = selectedBackgroundColor.shadowWithLevel(0.3)
```swift
let selectedBackgroundColor = NSColor.controlAccentColor
let pressedBackgroundColor = selectedBackgroundColor.withSystemEffect(.pressed)
```
let selectedBackgroundColor = NSColor.controlAccentColor
let pressedBackgroundColor = selectedBackgroundColor.withSystemEffect(.pressed)

<table>
<thead>
<tr>
<th>Birth name:</th>
<th>Chloesaurus Rex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth date:</td>
<td>5/18/2016</td>
</tr>
<tr>
<td>Species:</td>
<td>Velled Chameleon</td>
</tr>
<tr>
<td>Length:</td>
<td>30 cm</td>
</tr>
<tr>
<td>Weight:</td>
<td>3.2 oz</td>
</tr>
<tr>
<td>Tongue velocity:</td>
<td>4.2 m/s</td>
</tr>
</tbody>
</table>

- Omnivorous
- Cricket intake: 5 to 10
- Preferred temperature: 31 °C
- Excitement level: Low
- Scratch behavior: Hard Rubs
## Chloe
2 years old

### Photos

### Basics
- **Birth name:** Chioesaurus Rex
- **Birth date:** 5/18/2018
- **Species:** Veiled Chameleon
- **Length:** 30 cm
- **Weight:** 3.2 oz
- **Tongue velocity:** 4.2 m/s

### Diet
- **Cricket intake:** 5 to 10
- **Favorite berry:** Blueberry
- **Water intake:** 2 mL

### Temperatures
- **Preferred temperature:** 31 °C
- **Excitement level:** Low, Medium, W.W.O.O.

### Behavior
- **Courtship behavior:** Head Roll, Chin Rub
NSVisualEffectView

Translucent blur materials
• Onto desktop and other windows
• Onto content in the window

Enables vibrant foreground blending
NSVisualEffectView

Translucent blur materials
• Onto desktop and other windows
• Onto content in the window

Enables vibrant foreground blending
Nonsemantic Materials

Light
Dark
Medium Light
Ultra Dark
Semantic Materials

Popover
Menu
Sidebar
Selection
Titlebar
## Semantic Materials

<table>
<thead>
<tr>
<th>Category</th>
<th>Material</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Popover</td>
<td>Sheet</td>
<td>Tool Tip</td>
</tr>
<tr>
<td>Menu</td>
<td>HUD Window</td>
<td>Content Background</td>
</tr>
<tr>
<td>Sidebar</td>
<td>Header View</td>
<td>Window Background</td>
</tr>
<tr>
<td>Selection</td>
<td>Under Window Background</td>
<td>Under Page Background</td>
</tr>
<tr>
<td>Titlebar</td>
<td>Full-Screen UI</td>
<td></td>
</tr>
</tbody>
</table>
visualEffectView.material = .mediumLight
visualEffectView.material = .mediumLight
visualEffectView.material = .popover
# Desktop-Tinted Backgrounds

<table>
<thead>
<tr>
<th>Window Background</th>
<th>Under Page Background</th>
<th>Content Background</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Light Appearance</strong></td>
<td><strong>Light Appearance</strong></td>
<td><strong>Light Appearance</strong></td>
</tr>
<tr>
<td><strong>Dark Appearance</strong></td>
<td><strong>Dark Appearance</strong></td>
<td><strong>Dark Appearance</strong></td>
</tr>
</tbody>
</table>
# Desktop-Tinted Backgrounds

<table>
<thead>
<tr>
<th>Window Background</th>
<th>Under Page Background</th>
<th>Content Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light Appearance</td>
<td>Light Appearance</td>
<td>Light Appearance</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Window Background</th>
<th>Under Page Background</th>
<th>Content Background</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dark Appearance</td>
<td>Dark Appearance</td>
<td>Dark Appearance</td>
</tr>
</tbody>
</table>
NSWindow
Window background
Hi John!

We just got back from our trip to Vietnam and I wanted to share some of our photos with you. We backpacked through the country for two weeks and had an experience we'll never forget. The people were all incredibly friendly and we made a lot of new friends as we traveled around the country. You should do it next time!

Let's schedule a lunch date soon so that we can look at our photos together.

Raymond Sepulveda
Vietnam Trip
To: John Appleseed
# Desktop-Tinted Backgrounds

<table>
<thead>
<tr>
<th>Background NSColor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Window Background</strong></td>
</tr>
<tr>
<td><code>.windowBackgroundColor</code></td>
</tr>
<tr>
<td><strong>Content Background</strong></td>
</tr>
<tr>
<td><code>.controlBackgroundColor</code></td>
</tr>
<tr>
<td><strong>Content Background</strong></td>
</tr>
<tr>
<td><code>.textBackgroundColor</code></td>
</tr>
<tr>
<td><strong>Under Page Background</strong></td>
</tr>
<tr>
<td><code>.underPageBackgroundColor</code></td>
</tr>
</tbody>
</table>

*Note:* RGB values do not include desktop tint
Chloe
2 years old

Photos

Vitals

Birth name: Chioesaurus Rex
Birth date: 5/18/2018
Species: Veiled Chameleon
Length: 30 cm
Weight: 3.2 oz
Tongue velocity: 4.2 m/s

Cricket intake: 9 to 10
Favorite berry: Blueberry
Water intake: 2 mL

Preferred temperature: 31 °C
Excitement level: Low
Courtship behavior: Head Roll, Chin Rub
June 4, 2018
Chloe was very good today. She watched me practice my presentation and only fell asleep twice! Either I'm getting better or she's being more patient.

June 1, 2018
Today Chloe was feeling a little green. I think she must have a bug or something. The doctor said it was nothing to worry about, and to just make sure she gets plenty of water.

May 25, 2018
Tuesday! Took Chloe and Chester to the chameleon park today. Chloe got along great with all the chameleons in the neighborhood. It was very colorful!

May 18, 2018
Chloe's second birthday! We got her a dozen crickets.

May 14, 2018
Looked around for Chloe for three hours. Turns out she was just blending into my shirt the whole time 😊

May 9, 2018
Chloe got a bath today.

May 8, 2018
It turns out that there is a such thing as Chameleon flu. Had to give Chloe 5 spritzes from the water bottle to cool her down.
June 4, 2018
Chloe was very good today. She watched me practice my presentation and only fell asleep twice! Either I'm getting better or she's being more patient.

June 1, 2018
Today Chloe was feeling a little green. I think she must have a bug or something. The doctor said it was nothing to worry about, and to just make sure she gets plenty of water.

May 25, 2018
Tuesday! Took Chloe and Chester to the chameleon park today. Chloe got along great with all the chameleons in the neighborhood. It was very colorful!

May 18, 2018
Chloe's second birthday 😊🎈
We got her a dozen crickets.

May 14, 2018
Looked around for Chloe for three hours. Turns out she was just blending into my shirt the whole time 😦

May 9, 2018
Chloe got a bath today.

May 8, 2018
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Chloe was very good today. She watched me practice my presentation and only fell asleep twice! Either I'm getting better or she's being more patient.

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May 18, 2018
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We got her a dozen crickets.

May 14, 2018
Looked around for Chloe for three hours. Turns out she was just blending into my shirt the whole time 😥

May 9, 2018
Chloe got a bath today.

May 8, 2018
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June 4, 2018
Chloe was very good today. She watched me practice my presentation and only fell asleep twice! Either I’m getting better or she’s being more patient.

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May 18, 2018
Chloe’s second birthday 😊🎂🎂
We got her a dozen crickets.

May 14, 2018
Looked around for Chloe for three hours. Turns out she was just blending into my shirt the whole time 😜

May 9, 2018
Chloe got a bath today.
 inFile

May 8, 2018
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June 4, 2018
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We got her a dozen crickets.

May 14, 2018
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May 9, 2018
Chloe got a bath today.

May 8, 2018
It turns out that there is such a thing as Chameleon flu. Had to give Chloe 5 spritzes from the water bottle to cool her down.
The patient was presented and only...

May 25, 2018
Tuesday. Took Chloe and Chester to the chameleon park today. Chloe got along great with all the chameleons in the neighborhood. It was very colorful!

May 18, 2018
Chloe’s second birthday 😊tti!

May 14, 2018
Looked around for Chloe for three hours. Turns out she was just blending into my shirt the whole time 😳

May 9, 2018
Chloe got a bath today.

May 8, 2018
It turns out that there is such a thing as Chameleon flu. Had to give Chloe some spritzes from the water bottle to cool her down.
NSAppearance
NSAppearance

Light . aqua
NSAppearance

Light [.aqua]
NSAppearance

Light . aqua

Popup
NSAppearance

Light . aqua

Popup
NSAppearance

Light . aqua

labelColor

Popup
NSAppearance

Light .aqua

labelColor

Popup
NSAppearance

Light .aqua

labelColor

windowBackground

Popup
NSAppearance

Light . aqua

- labelColor
- windowBackgroundColor

Popup
NSAppearance

Light .aqua

- labelColor
- windowBackground

Dark .darkAqua

NEW

Popup

Popup
NSAppearance

Light .aqua

Dark .darkAqua

labelColor

windowBackground
NSAppearance

**Light**
- .aqua

**Dark**
- .darkAqua

**High Contrast Light**

**High Contrast Dark**
NSAppearance

Light .aqua

Dark .darkAqua

High Contrast Light

High Contrast Dark
NSAppearance

NSApplication follows the system
Can be overridden by setting `appearance`
NSApp.appearance = NSAppearance(named: .darkAqua)
NSApp.appearance = NSApearance(named: .aqua)
NSApp.appearance = nil
Always Dark Apps

Media focused apps
Color sensitive workflows

Leave it as a choice
• System preference
• In app preference if needed
Always Dark Apps

Do not set Vibrant Dark appearance on app or window

Use Dark Aqua instead
NSAppearance

Set on an individual NSWindow, NSView
Inherited by contained views
Drawing uses `view.effectiveAppearance`
June 4, 2018
Chloe was very good today. She watched me practice my presentation and only fell asleep twice! Either I’m getting better or she’s being more patient.

June 1, 2018
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May 9, 2018
Chloe got a bath today.

May 8, 2018
It turns out that there is such a thing as Chameleon flu. Had to give Chloe 5 spritzes from the water bottle to cool her down.
I've watched my patient's vitals for two years. Either I'm getting better or she's getting worse.

I think she must have a bug or something. The doctor said it was nothing to worry about, and to just make sure she gets plenty of water.

May 25, 2018
Tuesday. Took Chloe and Chester to the chameleon park today. Chloe got along great with all the chameleons in the neighborhood. It was very colorful!

May 18, 2018
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May 9, 2018
Chloe got a bath today.

May 8, 2018
It turns out that there is such a thing as Chameleon flu. Had to give Chloe 5 spritzes from the water bottle to cool her down.
textView.appearance = NSAppearance(named: .aqua)
textView.appearance = NSAppearance(named: .aqua)
tableView.appearance = NSAppearance(named: .vibrantLight)
tableView.appearance = NSAppearance(named: .vibrantLight)
tableView.appearance = NSAppearance(named: .vibrantLight)
0 lines of code
Steps to Look Great in Dark Mode

Run your app from Xcode 10 on 10.14
Steps to Look Great in Dark Mode

Run your app from Xcode 10 on 10.14

Replace static colors, images, materials
• System Colors
• Asset Catalog Colors

Remove accidental NSAppearance overrides
Advanced Dark Mode

Advanced NSAppearance

NSVisualEffectView and vibrant blending

Custom view drawing

View Debugger and Interface Builder

Back deployment strategies
<table>
<thead>
<tr>
<th>Lab Name</th>
<th>Technology Lab</th>
<th>Date/Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cocoa Lab</td>
<td>Technology Lab 9</td>
<td>Wednesday 9:00AM</td>
</tr>
<tr>
<td>Cocoa and Dark Mode Lab</td>
<td>Technology Lab 9</td>
<td>Wednesday 2:00PM</td>
</tr>
<tr>
<td>Cocoa Lab</td>
<td>Technology Lab 7</td>
<td>Friday 11:00AM</td>
</tr>
</tbody>
</table>

More Information

https://developer.apple.com/wwdc18/210